SOME FISHES OF THE ORDER AMPHIPRIONIFORMES.

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(Plates XXVII–XXVIII, Text-figures 1–4.)

On my return journey to Sydney from a collecting trip to the Great Barrier Reef last October, arrangements were made whereby I might work at the Queensland Museum, Brisbane, for a fortnight, thus being enabled to examine a number of type specimens of fishes. I am indebted to Mr. H. A. Longman, Director of the Museum, and Mr. T. C. Marshall for many courtesies and for facilities afforded.

My studies on the Pomacentrid fishes and their allies, based on the describing and figuring done at the Queensland Museum and later elaborated and extended in the Australian Museum, form the subject of this paper, which includes descriptive and taxonomic notes of some Australian and South Pacific species with figures of typical or topotypical specimens, and concludes with a synonymic check-list of the Australian species with indications of their distribution. The range of species outside Australia is not dealt with, as confusion would result from the inclusion of extralimital localities, many of which may be based on doubtful records and identifications of other authors. Type-localities have, however, been quoted, and, except where noted otherwise, all references to literature have been checked with the original books and papers.

Order AMPHIPRIONIFORMES mihi.

Pomacentroidei Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, pp. 1-166.
Pomacentriformes Regan, Ann. Mag. Nat. Hist. (8) xii, July 1913, p. 131.
Chromides Jordan, Classif. Fishes 1923, p. 218.

The fishes of the order Amphiprioniformes may easily be recognised from Bleeker's succinct definition :—" Bony, acanthopterygian fishes with simple nostrils, the presence of a single nasal opening on each side sufficing to distinguish all the embers from the other acanthopterygians."

The markedly serrated operculum and, in many species, the bold bands on the head and body, separate the Amphiprionidæ from the Pomacentridæ and their allies. Barnard[1] has used the term Amphiprionidæ to include the Pomacentridæ of authors, rightly pointing out that *Amphiprion* is an older generic name than *Pomacentrus*, but I propose to restrict the family Pomacentridæ to *Pomacentrus* and its allies (Pomacentrinæ, Parminæ, and Glyphisodontinæ in Australian waters). To have been consistent, some ichthyologists should have used the name Abudefdufidæ.

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[1] Barnard, Ann. S. Afr. Mus. xxi, 2, Oct. 1927, p. 728. The term Amphiprioninæ was used by Gill, Proc. Acad. Nat. Sci. Philad. 1859 (1860), p. 148.

The family Amphiprionidæ, as here understood, includes three closely allied genera : *Amphiprion* (logotype, *Lutjanus ephippium*), *Actinicola* (orthotype, *Lutjanus percula*), and *Phalerebus*, gen. nov. (orthotype, *Amphiprion akallopisos* Bleeker). The forms with conical or non-compressed teeth and less than 50 transverse series of scales on the body enter the family Chromidæ.

Premnas may be regarded as belonging to a separate family, the Premnidæ, near the Amphiprionidæ. *Cheiloprion*, *Hemiglyphidodon*, and *Stegastes* are also each probably worthy of family separation, to say nothing of several American genera.

Although the order Amphiprioniformes is easily separable from other orders of fishes, it is perhaps not very ancient, and most of the known genera appear to be emergent forms. Several fossils have been assigned to the "Pomacentridæ," but none of them appears to enter the order as now understood.

Priscacara Cope[2] from the Tertiary of the United States was at first compared with the Pomacentridæ but Haseman[3] regarded it as "an ancestral Cichlid," and Jordan[4] accords it family rank. I have not seen the description of *Chromis savornini*,[5] classed with the Pomacentridæ in the Zoological Record.

Odonteus Agassiz[6] was regarded as separable from the Sparoides and classed with the Sciænoides by its author, who remarked on its approach to *Heliases*. *O. sparoides*, the only species, is described as having large, well separated, conical teeth, first two dorsal spines subequal and less than half length of third, spinous dorsal high, body deep with a shallow caudal peduncle ; these features show that *Odonteus* is separable from the Amphiprioniformes.

ARTIFICIAL KEY TO AUSTRALIAN AND SOUTH PACIFIC GENERA.[7]

A. Fifty or more transverse series of scales. D.ix-xi. Bases of spinous and soft dorsals of about equal length. All opercles serrated.

B. Suborbital without a strong spine. AMPHIPRIONIDÆ.

C. Dorsals connected but notched. Occipital region naked. Caudal rounded .. .. *Actinicola* Fowler 1904.

CC. Dorsals without notch. Occipital region scaly. Caudal truncate or excavate.

D. Less than 18 dorsal rays. At least one tranverse band .. .. *Amphiprion* Bloch & Schneider 1801.

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[2] Cope, Bull. U.S. Geol. Surv. Terr. iii, 1877, p. 816, and Vertebrata Tert. Format. i, 1883, pp. 92 *et seq.*

[3] Haseman, Bull. Amer. Mus. Nat. Hist. xxxi, 1912, pp. 97-101.

[4] Jordan, Classif. Fishes (Stanford University Publications, Biol. Sci. iii, 2), 1923, p. 218.

[5] Arambourg, Nat. carte géol. Algèr. (1) vi, 1927, p. 162, pl. xvi, fig. 4, and pl. xvii, fig. 3.

[6] Agassiz, Recherches poiss. foss. iv, 1839, p. 178. Not *Odontœus* Klug, Abhandl. Berl. Akad. 1843, p. 37 (*fide* Gemminger & Harold, Cat. Coleopt. iii, 1868, p. 1080), a genus of Coleoptera.

[7] Extralimital genera not dealt with here, but included in the order, are : *Stegastes* Jenyns 1842, s.str. ; *Furcaria* Poey 1860, preocc. = *Demoiselles* Whitley 1928 ; *Hypsipops* Gill 1861 ; *Microspathodon* Günther 1862 ; *Euschistodus* Gill 1862 ; *Pomataprion* Gill 1863 ; *Agresia* Cooper 1864 ; *Onychognathus* Troschel 1866, preocc. = *Agripopa* Whitley 1928 ; *Hermosilla* Jenkins & Evermann 1888 ; *Nexilaris* Jordan & Evermann 1896 ; *Azurina* Jordan & Evermann 1898 ; *Nexilosus* Heller & Snodgrass 1903 ; *Azurella* Jordan 1919 ; *Centrochromis* Norman 1922 ; and *Plectroglyphidodon* Fowler & Ball 1925. Many of these may subsequently be removed to families or subfamilies distinct from the Pomacentridæ. *Zabulon* Whitley 1928 should be removed from the order on account of its three anal spines and superiorly situated lateral line.

DD. More than 18 dorsal rays. No transverse bands .. *Phalerebus*, gen. nov.

BB. Suborbital with a strong spine directed backwards. PREMNIDÆ *Premnas* Cuvier 1816.

AA. Less than 50 transverse series of scales. D.xii or more (rarely xi). Base of spinous dorsal much longer than that of soft.

E. Teeth conical, villiform, or subcylindrical; not compressed. CHROMIDÆ.

F. Teeth subcylindrical .. .. *Mccœnichthys* gen. nov.

FF. Teeth conical or pointed, sometimes in bands.

G. None of the opercles serrated.

H. External teeth of mandible directed outwards .. *Hoplochromis* Fowler 1918.

HH. External teeth of mandible not directed outwards.

I. Second anal spine nearly as long as head .. *Dorychromis* Fowler & Bean 1928.

II. Second anal spine slightly more than half length of head.

J. Each scale of body with 1 to 3 small basal auxiliary scales .. .. .. *Lepidochromis* Fowler & Bean 1928.

JJ. Body-scales without basal auxiliary scales .. .. *Chromis* Cuvier 1814 (syn. *Heliases* C. & V. 1830).

GG. Preoperculum, and sometimes suborbital, serrated.

K. D.xii-xiii.

L. Ground colour white with 3 dark transverse bands, strongly contrasted .. .. *Tetradrachmum* Cantor 1849 (syn. *Dascyllus* Cuv. 1829 & *Pirene* Gistel 1848).

LL. Colour fairly uniformly dark or dusky without strongly contrasted bands .. *Pellochromis* Fowler & Bean 1928.

KK. D.xvii *Acanthochromis* Gill 1863 (syn. *Heptadecacanthus* Alleyne & Macleay 1877).

EE. Teeth more or less compressed, at least anteriorly. POMACENTRIDÆ.

M. Lips normal. POMACENTRINÆ.

N. Preopercnlum serrated.

O. Spinous portion of dorsal and anal naked. Suboperculum and interoperculum serrated .. .. *Daya* Bleeker 1877.

OO. Spinous portion of dorsal and anal scaly. Suboperculum and interoperculum entire.

P. Thirteen (rarely 14) dorsal spines.

Q. Teeth in jaws biserial.

R. Snout scaly.

S. External teeth in jaws truncate. Caudal forked .. .. *Pomacentrus* Lacépède 1802 (syn. *Pristotis* Rüppell 1838).

SS. External teeth in jaws with somewhat rounded tips. Caudal lunate .. *Pseudopomacentrus* Bleeker 1877.

RR. Snout naked .. .. *Dischistodus* Gill 1863.

QQ. Teeth in jaws uniserial.

T. Snout scaly. Membrane of spinous dorsal incised and lobed. Caudal acutely lobed .. .. *Parapomacentrus* Bleeker 1877.

TT. Snout without scales. Membrane of spinous dorsal neither incised nor lobed. Caudal emarginate .. .. *Amblypomacentrus* Bleeker 1877.

PP. Twelve (rarely 11) dorsal spines.

U. Less than 30 transverse rows of scales.

V. Membrane of spinous dorsal deeply incised *Brachypomacentrus* Bleeker 1877.

VV. Membrane of spinous dorsal neither incised nor lobed .. .. .. *Eupomacentrus* Bleeker 1877.

UU. More than 30 transverse series of scales .. *Lepidozygus* Günther 1826.

NN. Preoperculum smooth.

W. Gill-rakers less than 40. GLYPHISODONTINÆ.

X. Generally 30 or less transverse series of scales. Unpaired fins with small scales which do not form dense sheaths.

Y. Orbicular or deeply ovoid; transverse bands dark, usually more than two in number.

Z. Oblong-oval; 3–4 rows of scales above end of upper section of lateral line; 5–7 dark transverse bands .. .. *Glyphisodon* Lacépède 1802.

ZZ. Orbicular; 1–2 rows of scales above end of upper section of lateral line. Transverse bands usually ill-defined or absent .. .. *Amblyglyphidodon* Bleeker 1877.

YY. Ovate, ovate-oblong, or oblong; sometimes with one dark or several white transverse bands.

A′. Oblong; 2 or 3 rows of scales above end of lateral line; anal base shorter than soft dorsal base .. .. *Negostegastes*, gen. nov.

AA′. Oval to ovate-oblong; 1 to 2 rows of scales above end of lateral line.

B′. Body ovate-oblong.

C′. All pharyngeal teeth pointed .. *Glyphidodontops* Bleeker 1877.

CC′. Pharyngeal teeth in part obtuse .. .. *Iredaleichthys* Whitley 1928 (syn. *Chrysiptera* Swainson 1839).

BB′. Body oval .. .. *Paraglyphidodon* Bleeker 1876

XX. Generally more than 30 transverse series of scales. Unpaired fins with dense scaly sheaths. PARMINÆ.

D′. Base of soft dorsal about half length of base of spinous dorsal .. .. *Parma* Günther 1862.

DD′. Base of soft dorsal about one-third length of base of spinous dorsal .. .. *Actinochromis* Bleeker 1877.

WW. Gill-rakers 70 to 80. HEMIGLYPHIDODONTINÆ .. .. *Hemiglyphidodon* Bleeker 1877 (syn. *Ctenoglyphidodon* Fowler 1918).

MM. Lips greatly thickened, fimbriate, and curled back over the snout. CHEILOPRIONINÆ *Cheiloprion* Weber 1913.

Family AMPHIPRIONIDÆ.

Amphiprion papuensis Maeleay.

(Plate XXVII, fig. 1.)

Amphiprion papuensis Macleay, Proc. Linn. Soc. N. S. Wales viii. 2. July 1883, p. 271. D'Entrecasteaux Group, New Guinea (Goldie, coll.). Typo in Austr. Mus., Sydney. *Id.* Jordan & Seale, Bull. U. S. Bur. Fish. xxv, 1905 (1906), p. 279. *Ex* Macleay. *Id.* McCulloch & Whitley, Mem. Qld. Mus. viii, 2, 1925, p. 166 (Queensland). *Id.* Whitley, Rec. Austr. Mus. xvi, 4, 1928, p. 218, pl. xvii, fig. 2. *Id.* Iredale & Whitley, Austr. Mus. Mag. iii, 7, 1928, p. 251, & fig.

Original description.—" D.10/14. A.2/12. L.lat.50. The height of the body is one-half of the length including the caudal fin. The colour is black, the muzzle and breast, as far as the root of the ventrals are yellowish, the soft dorsal, tail, and caudal fin are white, and there are two broad cross bands, as in *A. bicinctus*, one from the nape to the edge of the sub-operculum, the other across the body, from the back part of the spinous dorsal to the vent."

" Beeua" of the natives. D'Entreeasteaux Group.

Re-description of Holotype.—D.x/16 ; A.ii/13 (under microscope) ; P.18 V.i/5 ; C.13 ; Sc.50 ; L.tr.7/1/20 ; L.lat. 36 tubes.

Head (20 mm.) 3·4 in length to hypural joint (69). Depth (34·5) 2 in same. Eye (6) 3·3, interorbital (7) 2·9, and longest pectoral ray (17) 1·1 in head.

Profile of head unevenly rounded, fairly steep, gibbous before eyes. Dorsal profile more strongly arched than ventral. Head considerably higher than long and longer than broad. Preorbital notched with several small spines and one larger one pointing downward over the maxillary. Suborbital margin armed with spines of different sizes. Preopercular margin with 28 serrations. Operculum with three groups of large spines (5 + 8 + 14) ; subopercular with a similar group of 9 spines. Front of head, mouth, and chin naked ; rest of head scaly. Irregular raised ridges on preorbital, suborbital, and on lower preopercular limb. About 21 predorsal scales. Interorbital broad, plano-convex. Jaws subequal. A single series of blunt, slightly curved, conical teeth in each jaw. Tongue fleshy, with a rounded margin. Palatal velum present.

Body elevated, strongly compressed, widest anteriorly, entirely covered with small, regular, ctenoid scales, which extend a short way on to the membranes of all the fins except the ventrals. The lateral line rises sharply anteriorly, following the dorsal curvature to below the posterior portion of the soft dorsal, and bears 36 tubes. There are a few punctured scales on the sides and caudal peduncle.

Dorsal originating slightly behind the vertical of the operculum. Spinous portion with a convex outline ; dorsal rays gradually increasing in height backwards to form a somewhat pointed lobe which does not reach the vertical of the hypural joint. Anal similar in form to soft dorsal but with a longer base and its lobe not reaching so far back as that of the dorsal. The anal terminates slightly in advance of the last dorsal ray. Pectorals and ventrals broad, rounded. Caudal margin concave ; the lobes were probably pointed, but the tips of the rays have been broken off.

Colour.—After long preservation in alcohol, the general body-colour is chocolate brown (perhaps blackish in life), becoming much lighter on the breast and face. Caudal peduncle and fin yellowish (perhaps white in life). A broad pearly band extends from the occiput to the suborbital, crossing part of the preoperculum and operculum, and meeting its fellow on the other side on the nape. A similar but broader band crosses the body from the dorsal notch to the vent, missing the anal fin, but entirely encircling the fish, and not bent backwards to include the edge of the soft dorsal. Anal, spinous dorsal and ventrals, blackish brown. Soft dorsal, caudal, and pectorals yellowish.

Described and figured from the holotype of *Amphiprion papuensis* Macleay, a specimen 69 mm. in standard length. Originally in the Macleay Museum, University of Sydney, and labelled " Amphiprion Papuensis, n. sp." in Macleay's handwriting, it was presented by the Committee of Management of the Macleay Museum to the Australian Museum in 1907 ; Regd. No. *I. 9240.*

Variation.—In two Queensland specimens, the width of the body-band where it crosses the lateral line is equal to the distance from the posterior border of the eye to the tip of the snout. In the type, the band is narrower. The anal fin is black with white tips to the rays in one specimen, but has a tendency to become light brown posteriorly in the other. D.x-xi/16.

Larva.—I have already described and figured a larval specimen, 8·8 mm. long, from Queensland (*loc. cit.*, 1928).

Localities and *Distribution.*—D'Entrecasteaux Islands, off south-eastern Papua (Andrew Goldie); holotype. Port Denison, Queensland (E. H. Rainford); 2 specimens. Holbourne Island, Queensland (E. H. Rainford); larva. Bowen, Queensland (E. H. Rainford); 2 specimens in the Queensland Museum.

Affinities.—Amphiprion papuensis appears to be a "good" species, but is evidently closely allied to several others from the Indo-Pacific region. The colouration of the fins, width of the bands, concave caudal margin, and scale-counts are diagnostic characters.

Bory de Saint Vincent[8] figured a small West Australian *Amphiprion* as *Sparus milii* which resembles *A. papuensis* but has broader stripes and a dark soft dorsal. Thiollière[9] has doubtfully recorded this species from Woodlark Island which is near the D'Entrecasteaux Group, and his remarks, based on a drawing, may refer to *A. papuensis*.

The following nominal species may be grouped with *A. papuensis*, as they are evidently closely related to it, but further data regarding their variation are desirable before discussion as to their validity can be entered into:—*Amphiprion bicinctus* Rippell,[10] *A. chrysogaster* C. & V.,[11] *A. xanthurus* C. & V.,[12] *Anthias clarkii*, Bennett,[13] *Amphiprion japonicus* Temminek & Sehlegel,[14] *A. chrysargyrus* Richardson,[15] and *A. melanostolus* Richardson.[16] *Amphiprion boholensis* Cartier[17] and *A. snyderi* Ishikawa[18] are also probably allied to *A. papuensis*. If colour differences prove too variable for use as diagnostic characters, it may be possible eventually to sort out the "good" species from the invalid ones by studying geographical distribution of the various forms. The tendency of modern writers, however, has been to "lump" species described from widely separated localities as synonyms of one well-known species, but later separation may prove necessary. Fowler & Bean[19] in their admirable work on the Philippine forms have united most of the species of *Amphiprion* mentioned above with *A. polymnus*.

Amphiprion papuensis is closely allied to the species well figured as *Amphiprion polymnus* by Jordan & Seale[20] but the body-band is broader and there

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[8] Bory de Saint Vincent, Dict. Classique d'Hist Nat. xvii. 1831, p. 130, pl. cxiii, fig. 2. Shark's Bay, West Australia. (Not Mauritius as stated by Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 402, who confuse this species with *Sparus mylio* Lacépède.)

[9] Thiollière, Ichthyologie in Montrouzier, Essai Faun. Île Woodlark, 1857 (*ex* Ann. Soc. Imp. Hist. Nat. Lyon, 1856), p. 198.

[10] Rüppell, Atlas zu Rüppell, Reise (Senckenb. Nat. Ges.), Fische, 1830-1831, p. 139, pl. xxxv, fig. 1. Tor & Massowah, Red Sea.

[11] Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 400. Bourbon.

[12] Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 402. No loc. = East Indies.

[13] Bennett, Fish. Ceylon, 1830, pl. xxix. Ceylon.

[14] Temminck & Schlegel, Faun. Japon. Poiss., 1843, p. 66. Japan.

[15] Richardson, Rept. 15th meet. Brit. Assn. Adv. Sci. 1845 (1846), p. 254. China.

[16] Richardson, Ann. Mag. Nat. Hist. ix, July 1, 1842, p. 390. Depuch I., W. Austr.

[17] Cartier, Verh. Ges. Würzb., 1873, p. 96. Bohol, Philippines.

[18] Ishikawa, Proc. Tokyo Mus. i, 1904, p. 11, pl. v. Japan.

[19] Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 6.

[20] Jordan & Seale, Proc. Davenport Acad. Sci., x, 1905, p. 13, pl. vii. Hong Kong.

are fewer scales. The Chinese fish has light ventrals and anal, but these fins are dark in *A. papuensis*; again the dorsal fin of the former is light whereas in the latter it is dark. Bloch's figure[21] of *Anthias polymnus* shows a white band round the caudal peduncle, probably a juvenile character which disappears with age; it has also dark fins and a rounded caudal. Linnæus' original description of *Perca polymna*[22] does not enable me to state with certainty whether Bloch's and Jordan & Seale's identifications are correct, but Linnæus' "faseiis 3 albis" exclude *Amphiprion papuensis* from consideration.

Bleeker[23] has figured two specimens of so-called *Prochilus polymnus*. His figure 8 seems to represent the true *A. polymnus* but figure 7 approximates *A. papuensis*, but it shows a dark soft dorsal and larger scales. He later[24] recognised four varieties of this species, but the names he uses for them may have to be restricted further when more is known of the geographical races or varieties of this and allied species.

Amphiprion mccullochi sp. nov.

Amphiprion melanopus Ogilby, Austr. Mus. Mem. ii, 1889, p. 64. *Id.* Waite, Rec. Austr. Mus. v, 1904, pp. 168 & 208. Lord Howe Island. Not *A. melanopus* Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 561. Amboina.

Amphiprion McCulloch, Austr. Mus. Mag. i, 1921, p. 34 (habits).

D.x/15-18; A.ii/13-16.

Dorsal, pectoral, ventral, and anal fins black; caudal whitish. Caudal fin more or less emarginate, the lobes sometimes pointed. In a large series of specimens, one young one (Austr. Mus. No. *I. 5392*) has the caudal black like the other fins, whilst another (*I. 5730*) has lighter pectorals, but these are exceptional. Opercular band not nearly reaching the top of the nape, except in very young specimens: it is sometimes absent in adults. A vertical band across the middle of the body, and another one across the caudal peduncle in the young.

In *Amphiprion melanopus* Bleeker, with which *A. mccullochi* has been confused, the dorsal is yellowish, not black, and the opercular band extends to the top of the nape. When Ogilby, and later Waite, recorded this species from Lord Howe Island, they noted several differences between it and typical *A. melanopus* but did not propose an alternative name. *Amphiprion mccullochi* has been brought alive from Lord Howe Island to Sydney and may be seen in the Taronga Park Aquarium.

The holotype of *Amphiprion mccullochi* is an Australian Museum specimen, 78 mm. in length to the end of the middle caudal rays; Regd. No. *Ia. 1962*. It was collected at Lord Howe Island by my late senior colleague, Allan Riverstone McCulloch, to whose memory I dedicate the species.

Actinicola percula (Lacépède).

"*Tetragonopterus cinereus lævis*," &c., Klein, Mis. Pisc. iv, 1749, p. 38, No. 5, pl. xi, fig. 8 (*fide* Bloch, 1797). Pre-Linnean.

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[21] Bloch, Nat. Ausl. Fische vi, 1792, p. 103 (*fide* Sherborn, Index Animalium); Ichthyologie, ix, 1797, p. 89, pl. cccxvi, fig. 1. East Indies.

[22] Linnæus, Syst. Nat., ed. 10, 1758, p. 291, No. 8. Indies. *Idem.*, Gmelin, *ibid.* ed. 13, i, 3, 1789, p. 1313.

[23] Bleeker, Atl. Ichth. ix, 1877, pl. cccc, figs. 7-8.

[24] Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 28.

"*Chætodon macrolepidotus*," &c., Seba, Thesaur. iii, 1758, p. 71, No. 29, pl. xxvi, fig. 29 (*fide* Bloch, 1797). Non-binomial.

Perca sp. Tyson, Phil. Trans. Roy. Soc. Lond. lxi, 1771, p. 247, pl. vii, fig. 8; *ibid.* (abridged ed.) xiii, 1809, p. 136, pl. iii, fig. 10. South Seas.

"*Der glatte Flünderaff*" Klein, Neuer Schaupl. Natur. iii, 1776, p. 153, No. 5 (*fide* Bloch, 1797).

Anthias polymnus var. Bloch, Nat. Ausl. Fische vi, 1792, p. 105; Ichthylogie ix, 1797, p. 91, pl. cccxvi, fig. 3. East Indies. Not *Perca polymna* Linn.

Amphiprion polymnus var. Bloch & Schneider, Syst. Ichth., 1801, p. 203.

Lutjanus polymna var. Lacépède, Hist. Nat. Poiss. iv, 1802, p. 224. *Ex* Bloch.

Lutjanus percula Lacépède, Hist. Nat. Poiss. iv, 1802, pp. 194 & 239. Port Praslin, New Britain; collected by Commerson, July 1768.

Amphiprion polymnus Cloquet, Dict. Sci. Nat., ed. 2, ii, Oct. 1816, suppl. p. 25, pl. [xlv], fig. 2. Moluccas & Coromandel. Not *Perca polymna* Linn.

Amphiprion tunicatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 399, pl. cxxxii, fig. 2. Vanikoro. *Idem.* Lesson, Voy. Coquille, Zool. ii, 1831, p. 192, pl. xxv, fig. 3. New Guinea specimen figured. Name mis-spelt *A. punicatus* by Swainson, Nat. Hist. Class. Fish, Amph. Rept. ii, 1839, p. 217.

Amphiprion percula Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 397. *Idem.* Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 287. *Idem.* Schmeltz, Mus. Godef. Cat. v, 1869, p. xviii (Pelew Is.). *Idem.* Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales i, March 1877, p. 342 (Darnley I., Q.). *Idem.* Saville-Kent, Gt. Barrier Reef. Austr., 1893, pp. 33 & 145, chromo-pl. i. *Idem.* Cockerell, Mem. Qld. Mus. iii, 1915, p. 42 (scales). *Idem.* McCulloch & Whitley, Mem. Qld. Mus. viii, 1925, p. 165. *Idem.* Whitley, Rec. Austr. Mus. xvi. 1, 1927, p. 24 (not Port Darwin record).

Amphiprion ocellaris Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 399. Sumatra. Type in British Museum.

Amphiprion melanurus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 400. Sumatra. Type in British Museum.

Prochilus percula Bleeker, Nat. Tijdschr. Dierk. i, 1863, p. 241. Obi (*fide* Fowler & Bean, 1928).

Trachichthys (*Amphiprion*) *tunicatus* Sluiter, Zool. Anzeiger xi, 1888, pp. 240-243 (habits). Bay of Batavia.

Amphiprion (*Actinicola*) *percula* Fowler, Journ. Acad. Nat. Sci. Philad. (2) xii, 4, 1904, p. 533. *Idem.* Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 11 (*q.v.* for refs. to literature not repeated here).

Variation.—Actinicola percula is well represented in the Australian Museum collection by numerous specimens from Queensland and Indo-Pacific localities. An examination of these shows the following variation:—D.x/15-18 (normally 16); A.ii/12 (rarely 13); 29-38 l.lat. tubes. The number of serrations on the opercles is too variable to be of diagnostic value. The number of transverse rows of body-scales is also variable but is generally less than 60. The areas between the black-edged white bands are mostly light in tone; the ventrals are light, with dark edges, and most of the caudal is light.

Included in the series were some specimens from Port Darwin, North Australia, with 11 dorsal spines, dark breast and pectorals, areas between white bands dark, and most of caudal dark. These I regard as specifically separable from *A. percula* and are identified as *A. bicolor* Castelnau: *vide infra*. A large specimen also confused with *A. percula* has D.xi/17; A.ii/12; l.lat. with 42 tubes; more than 60 transverse rows of body-scales. This evidently represents a new species of *Actinicola* but I refrain from naming it as the specimen is without locality or data.

Very young specimens of *A. percula* sometimes have the areas between the white bands dark, but may at once be distinguished from *A. bicolor* by their light-coloured snouts and 10 dorsal spines. Andaman Islands specimens appear to be referable to a subspecific form distinct from the true *A. percula* (*vide* Day, Fish. India 1877, pp. 378 & 379, pl. lxxx, fig. 4; Proc. Linn. Soc. Lond. xv, 1881, p. 52; Faun. Brit. India, Fish. ii, 1889, p. 377).

Hosts.—In Queensland, *Actinicola percula* has been recorded from the Sea Anemones *Stoichactis haddoni* and *S. kenti* (Saville-Kent, *loc. cit.*, as *Discosoma*). It was commonly seen by me nestling amongst anemones' tentacles at Low Isles, and less commonly at Michaelmas Cay, North Queensland, but I have never seen one actually inside an anemone's stomach.

Actinicola bicolor (Castelnau).

(Plate XXVII, Fig. 2.)

Amphiprion bicolor Castelnau, Proc. Zool. Acclim. Soc. Vict. ii, May 10, 1873, p. 92. Port Darwin, North Australia. Type in Paris Museum. *Id.* Macleay, Proc. Linn. Soc. N S. Wales ii, June 1878, p. 361.

Amphiprion percula Klunzinger, Sitzb. Akad. Wiss. Wien lxxx, 1, 1879, p. 376. Not *Lutjanus percula* Lacépède.

Amphiprion bicolor Weber & de Beaufort, Fish. Indo-Austr. Archip. i, 1911, p. 63.

Amphiprion percula Whitley, Rec. Austr. Mus. xvi, 1, 1927, p. 24. Port Darwin specimens only. Not *Lutjanus percula* Lacépède.

D.xi/15; A.ii/13; P.i/16; V.i/5; C.15. L.lat. 34 tubes. L.tr.6/1/23.

Head (16·5 mm.) 3·1 in length to hypural joint (52). Depth (25) 2·08 in same. Eye (4) 4·1, interorbital (5) 3·3, and longest pectoral ray (13) 1·3 in head.

Profile somewhat gibbous before the dorsal, slightly concave at the nape and convex before the eyes. Dorsal outline much more arched than ventral. Head higher than long, longer than broad. Preorbital notched, with a strong spine and two or three smaller ones; similar spines along suborbital. Angle and lower half of the preopercular serrated. Operculum, interopercular, and subopercular with long spines. Opercles scaly, scales becoming vestigial on cheeks. Nape, front of head, and chin naked. Lower orbital margin, preorbital, suborbital, and inframarginal area of preopercular with series of raised ridges. The nostrils are almost surrounded by them. Circular pores along margins of subopercular and preopercular and a few scattered on the face. About 17 predorsal scales; the foremost hardly reaches the nuchal band. Interorbital broad, slightly depressed mesially. Lower jaw slightly longer than upper. A single series of blunt teeth in each jaw. Tongue acute, with a blunt tip. A palatal velum present.

Body elevated, compressed, entirely covered with small cycloid scales which extend a short way on to the bases of all the fins except the first dorsal and the ventrals. Lateral line rising sharply from over the opercular to below the first dorsal, whence it descends in an irregular course to terminate below the second dorsal. Some punctured scales on the sides of the caudal peduncle.

Dorsal originating slightly behind the vertical of the hindmost part of the opercular and terminating somewhat behind the end of the anal base. The spines are elevated anteriorly, but decrease in height posteriorly to form a notch before

the eleventh longer spine which preeedes the rounded soft dorsal, whose lobe does not reach the vertical of the hypural joint. Anal similar in form to soft dorsal. Pectorals, ventrals, and caudal broadly rounded.

Colour.—After long preservation in alcohol, the ground-colour is brownish black which extends on to all the fins. Three light-edged whitish bands cross the ground-colour. The first begins on the nape, where it joins its fellow from the other side, and descends behind the eye and across the operculum to taper to a point on the interoperculum. The second begins at the dorsal notch and crosses the body in the form of a broad chevron. The third traverses the caudal peduncle and, like the second, completely encircles the fish. A broad whitish margin to the pectoral and remains of what were probably white marginal bands in the young are still to be seen near the tips of some of the dorsal and caudal rays.

Described and figured from a specimen, 68 mm. in total length, from the type-locality, Port Darwin, North Australia (Austr. Mus. Regd. No. *A. 4834*); collected on a coral reef by Alexander Morton in 1879.

Variation.—Besides the specimen dealt with above, there are three specimens of *Actinicola bicolor* in the Australian Museum. One was collected by Morton at the same time as the described specimen; the others were collected at Port Darwin by Messrs. Christie and Godfrey. In the smallest (38 mm. long), the second white cross-band includes five dorsal spines and is produced backwards superiorly to form a broad white margin to the soft dorsal. The anal lobe and the caudal fin are also margined with white. These conditions are also met with in a specimen of 54 mm. The relative widths of the cross-bands vary in individual specimens. The raised ridges on the head are not found in the young, but there are additional ridges on the interoperculum of my largest specimen (73 mm.).

Locality and Known Range.—Port Darwin, North Australia.

Affinities.—Very closely allied to *Actinicola percula* (Lacépède), but with eleven dorsal spines, and the face, ventrals, and areas between the cross-bands uniformly dark.

The original description of this species, by Castelnau, is probably inaccurate in such details as fin-formulæ.

PHALEREBUS, gen. nov.

Orthotype.—*Prochilus alkallopisos* (Bleeker).

Prochilus akallopisus Bleeker[25] is distinguished from *Amphiprion* and *Actinicola* by its increased number (19-21) of dorsal rays and the absence of transverse bands. It was originally described[26] as *Amphiprion akallopisos*.

Amphiprion nigripes Regan[27] from the Maldive Islands is apparently congeneric.

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[25] Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, pp. 22 & 35; Atl. Ichth. ix, 1877, pl. cccc, fig. 3.

[26] Bleeker, Nat. Tijdschr. Ned. Ind. iv, 1853, p. 281. Priaman.

[27] Regan, Trans. Linn. Soc. Lond. xii, 1908, p. 230, pl. xxiv, fig. 2.

Family CHROMIDÆ.

Tetradrachmum melanurus (Bleeker).

(Text-fig. 1.)

Dascyllus aruanus var. *a.* "*pinna caudali postice nigra*" Bleeker, Nat. Tijdschr. Ned. Ind. ii, 1851, p. 246. Sumbawa, East Indies.

Dascyllus melanurus Bleeker, Nat. Tijdschr. Ned. Ind. vi, 1854, p. 109. Sumbawa, &c., East Indies. *Id.* Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 12, and Journ. Mus. Godef. xv (Fische Südsee vii), 1881, p. 236 (not plate).

Tetradrachmum melanurus Bleeker, Ned. Tijdschr. Dierk. i, 1863, p. 231 (*fide* Weber & Beaufort, 1911). *Id.* Bleeker, Atl. Ichth. ix, 1877, pl. ccccix, fig. 1 and Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, pp. 144 & 149. *Id.* Weber & Beaufort, Fish. Indo-Austr. Archip. i, 1911, p. 385 (references).

Pomacentrus onyx De Vis, Proc. Linn. Soc. N. S. Wales viii, 4, Feb. 21, 1884, p. 451. South Seas. Type in Queensland Museum seen.

Tetradrachmum melanurum Steindachner, Abhand. Senckenberg Ges. xxv, 1900, p. 438 (*fide* Fowler & Bean, 1928).

Dascyllus (*Dascyllus*) *melanurus* Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, pp. 14 & 20 (references).

Re-description of **Pomacentrus onyx** De Vis.

D.xii/13; A.ii/12; P.15; V.i/5; C.15. Lateral line with 17 tubes. Se.23. L.tr.3/1/8.

Head (12 mm.) 2·8 in length to hypural joint (34). Depth (21) 1·6 in same. Eye (5) 2·4, interorbital (4·5) 2·6, snout (3) 4·0 in head.

Profiles markedly convex, the upper more so than the lower. Head almost entirely scaly. Eye large; interorbital broad, convex. Snout bluntly rounded. Suborbital and preoperculum with small, regular serrations; other opercles entire. Jaws subequal. Maxillary reaching to below anterior half of eye. A row of small conical teeth in each jaw.

Body elevated, compressed, covered with ctenoid scales which are largest on the sides, in about 23 transverse rows between opercular and hypural joint, and extending on to the fins. Lateral line originating over the operculum between two strongly ctenoid scales and terminating below the soft dorsal. Ventrals with axillary scales.

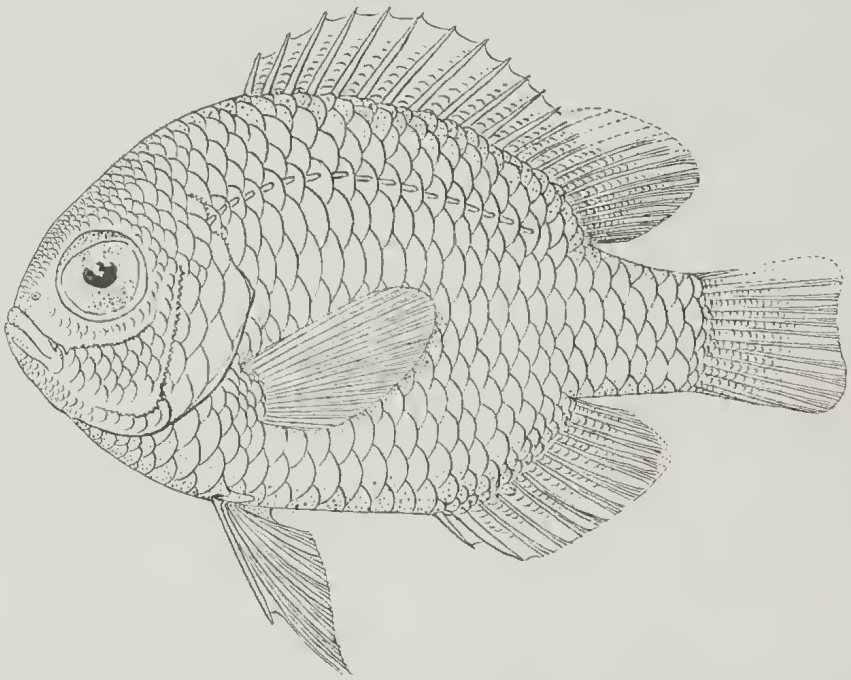
Dorsal originating behind the vertical of the origin of the ventrals and terminating behind the anal. Spinous dorsal higher than soft portion. Anal spines strong, soft portion of the fin similar to that of dorsal but with a longer base. Pectoral shorter than head, rounded, the upper rays longest. Ventrals pointed, reaching the first anal spine when adpressed. Caudal lobes probably bluntly rounded, but the tail of the type is damaged.

The type of *Pomacentrus onyx* De Vis is a faded formalin specimen and no colour markings can now be traced. De Vis described the colouration as follows:—"Four black bands, first over the eye to the chin and chest. Second from anterior half of spinous dorsal to ventral. Third from posterior half of soft dorsal to anal. Fourth forming a large ovate patch covering the end of the caudal. Ventrals black."

Described and figured from the leetotype of *Pomacentrus onyx* De Vis, a specimen 34 mm. in length from snout to hypural joint, selected from a series of seven co-types, 21-39 mm. (Qld. Mus. Regd. No. *I. 11/99.*)

Locality.—" South Seas." Collected by Captain Browne.

NOTE.—*Chætodon araneus* Bennett[28] from Ceylon is the *Dascyllus aruanus* " variëteit met eene zwarte staartvin" of Sehlegel & Müller,[29] and appears to be speeifieally distinet from *Tetradrachmum melanurus* (Bleeker).



Text-fig. 1.—*Tetradrachmum melanurus* (Bleeker). Lectotype of *Pomacentrus onyx* De Vis from the " South Seas." (The usual dark bands have completely faded from De Vis' types, so cannot be included in this figure.)

G. P. Whitley, del.

MECÆNICHTHYS, gen. nov.

Orthotype.—*Heliastes immaculatus* Ogilby.

Eye large. All opercles entire. No preorbital spine or notch. Top of head scaly to level of nostrils. Suborbital naked, not adnate to cheek. A single series of well-developed, fixed teeth in each jaw; each tooth is slightly curved, subcylindrical near its base with a bluntly pointed tip, and is not fused with its neighbours, nor are there gaps between the teeth. Gill-rakers short.

Body deep, eompressed, suborbicular, scaly. Caudal peduncle short and broad. Ctenoid scales in less than thirty transverse series, extending on to all the fins except ventrals. Thirteen dorsal spines. Base of soft dorsal nearly half length

[28] Bennett, Fish. Ceylon, Feb. 1830, p. 17, pl. xvii.

[29] Schlegel & Müller, Verh. Nat. Ges. overz. Pisc., 1844, p. 21.

of base of spinous dorsal. Two anal spines. Caudal bilobed. First ventral ray produced. Pectoral at least as long as head.

Fairly uniformly dark in colour with no transverse bands.

Mecænichthys immaculatus (Ogilby).

Heliastes immaculatus Ogilby, Proc. Linn. Soc. N. S. Wales x, 3, Dec. 21, 1885, p. 446. Shark Reef, Port Jackson. Type in Austr. Museum seen. *Id.* Ogilby, Cat. Fish. N. S. Wales 1886, p. 44.

Heliases immaculatus Waite, Austr. Mus. Mem. iv, 1, 1899, p. 86, pl. xiv.

Chromis hypsilepis Waite, Mem. N. S. W. Nat. Club ii, 1904, p. 37. Ref. to Waite only. Not *Heliastes hypsilepis* Günther, Ann. Mag. Nat. Hist. (3) xx, July 1, 1867, p. 66.

Chromis ? immaculatus McCulloch, Zool. Res. Endeav. i, 1911, p. 74.

Glyphisodon immaculatus McCulloch, Austr. Zool. ii, 3, 1922, p. 95, pl. xxviii, fig. 253c.

A specimen from Cape Moreton in the Queensland Museum (Regd. No. *I. 2547*) agrees with the original description but has four rows of scales on the cheek instead of eight as given by Ogilby. Reference to the type in the Australian Museum (*B. 7254*), however, shows that four is the correct number of longitudinal rows of cheek-scales.

New record for Queensland. Waite (1904) has considered this species to be identical with *Chromis hypsilepis* (Günther), but it is readily distinguished by its much rounder body, shorter and broader caudal peduncle, larger number of dorsal and anal rays, and by the absence of the black spot on the base of the pectoral, and the white spot on the caudal peduncle. In *Chromis hypsilepis* the teeth are conical and in several series, the outer being the larger.

Family POMACENTRIDÆ.

The early systematic writers on fishes grouped what are now known as Pomacentridæ with other brightly coloured coral fishes. Noteworthy in this regard are Linnæus, Forskal, Gmelin, Gronovius, Bloch, and Lacépède, who described many species under the genera *Chætodon*, *Holocentrus*, *Labrus*, &c., from which they are well separated to-day. The first generic differentiation of a Pomacentrid from this *Chætodon*-complex of the ancients was made by Forskal[30] who noted, by the Arabic term "*Abu-defduf*," a species (*Chætodon sordidus*) from the Red Sea. I have elsewhere[31] suggested, however, that the names in Forskal's "Descriptiones Animalium" be disregarded as being of taxonomic validity, and *Abudefduf* is not regarded as a permissible generic name.[32]

Passing *Prochilus* Klein 1775 = Walbaum 1792, as a non-binomial name revived by Bleeker for the Amphiprionid fishes, and *Amphiprion* Bloch & Schneider 1801, the next strictly Pomacentrid genus defined appears to be *Pomacentrus* Lacépède,[33] and, as this is the first valid generic name encountered, the family name must be Pomacentridæ. Jordan, in his "Genera of Fishes," gives *Chætodon pavo* Bloch as the genotype of *Pomacentrus* "by general consent," but the type-designation

[30] Forskal, Descriptiones Animalium 1775, pp. xiii & 59.

[31] Whitley, Rec. Austr. Mus. xvi, 1928, p. 230.

[32] *See* however Jordan & Seale, Bull. U. S. Bur. Fish. xxv. 1906, p. 284, footnote.

[33] Lacépède, Hist. Nat. Poiss. iv, 1803, p. 505.

has been satisfactorily accomplished in an obscure work to which my attention has been directed by my friend Mr. Tom Iredale. The logotype of *Pomacentrus* was selected by Guichenot,[34] who wrote " L'espèce qui a servi de type à l'etablissement de ce genre est le *Pomacentrus pavo* des auteurs." This statement occurs in livraison 598 of Guichenot's work and was probably published in 1838 (*teste* T. Iredale).

As here restricted the family Pomacentridæ includes *Pomacentrus* and its allies with compressed teeth and a denticulate preoperculum but, in the broad sense, accommodates *Glyphisodon*, *Parma*, and their relatives.

Pomacentrus suvarovensis Stead.

Pomacentrus suvarovensis Stead, Note Coll. Fish. Suwar. Is., 1907, p. 4, pl. i. Suwarow Island.

In September 1907, the Department of Fisheries in Sydney published, by Government authority, a booklet entitled " Note on a Small Collection of Fishes from Suwarow Island," by David G. Stead. Only two new species were therein described : *Pomacentrus suvarovensis* and *Canthigaster australis*. The holotype and paratypes of the Pomacentrid species were later presented to the Australian Museum where they are Regd. Nos. *Ia. 2460* and *2461-2464* respectively. Examination of these shows that the species is a true *Pomacentrus* allied to *P. pavo*.

Locality.—Suwarow Island, South Pacific Ocean (Lat. 13° 13′ S., Long. 163° 09′ W.) ; collected by A. G. Hobbs.

Pseudopomacentrus niomatus (De Vis).

(Text-fig. 2.)

Pomacentrus niomatus De Vis, Proc. Linn. Soc. N. S. Wales viii, 4, Feb. 21, 1884, p. 451. " Locality probably South Sea Islands." Type in Qld. Mus. examined.

Pomacentrus inornatus Jordan & Seale, Bull. U. S. Fish. Bur. xxv, 1906, p. 281. *Emend. pro P. niomatus* De Vis. (Apia, Samoa.)

D.xiii/14 ; A.ii/14 ; P.16 ; V.i/5 ; C.15. Sc.25 ; 16 tubes on L.lat. plus 2 series of punctured scales. L.tr. 3/1/9.

Head (16 mm.) 3·0 in length to hypural joint (48). Depth of body (24) 2·0, and depth of caudal peduncle (7) 6·8 in the same. Eye (6·5) 2·4, snout (4) 4·0, and interorbital (5) 3·2 in head.

Eye large. Preorbital with a marked notch ; suborbital very narrow, scaleless, with one or two serrations anteriorly. Preoperculum finely serrated, its lower limb entire. Two or three rows of scales on cheeks. Small scales cover the interorbital and extend well forward over the snout. The operculum of the type is now denuded of scales. Interorbital very slightly convex. Maxillary reaching beyond vertical of anterior margin of eye. A series of compressed incisors in each jaw and extending along the rami.

Body deep, compressed, covered with large scales which form sheaths for the proximal portions of the dorsal and anal fins.

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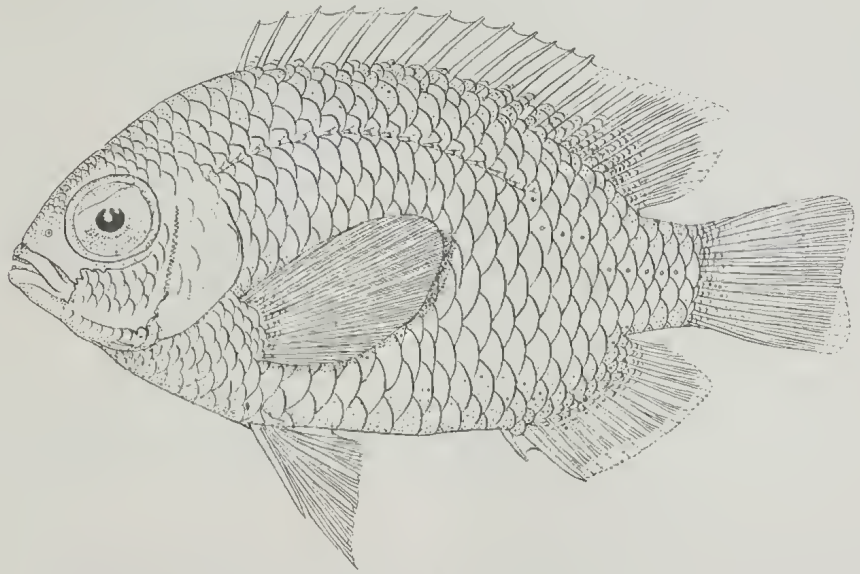
[34] Guichenot, Dict. pittoresque d'Histoire Naturelle viii, " 1839 " (1838 ?), p. 502.

Dorsal originating in advance of the vertical of the origin of the ventrals and terminating a little behind the anal. The spines increase in height posteriorly. Ventrals reaching the vent. The soft portions of the fins are slightly damaged in the type but their margins were probably somewhat pointed.

The colour of the type has faded to a uniform yellowish with some silvery flecks on the sides. According to De Vis, it was uniform pale brown with a minute black super-axillary spot.



Text-fig. 2.—*Pseudopomacentrus niomatus* (De Vis). Holotype of *Pomacentrus niomatus* De Vis from the "South Sea Islands."
G. P. Whitley, del.

Described and figured from the holotype of *Pomacentrus niomatus* De Vis, a specimen 48 mm. from snout to hypural joint. (Qld. Mus. Regd. No. *I. 11/111.*) This species is closely allied to *Pomacentrus trilineatus* Bleeker (*non* Cuv. & Val.), part[35] but lacks the spot on the caudal peduncle and has a serrated suborbital.

Regan[36] has wrongly identified *Pomacentrus inornatus* De Vis from Easter Island. The species he figures is, however, a new species of *Eupomacentrus* which may now be known as *E. paschalis* (*vide* p. 225 of this paper).

Fowler[37] has recorded *Pomacentrus inornatus* from Laysan Island, but it seems doubtful whether De Vis' species occurs in such high latitudes.

Pseudopomacentrus flavicauda (Whitley).

Pomacentrus flavicauda Whitley, Rec. Austr. Mus. xvi, 6, June 11, 1928, p. 297, fig. 1. North-west Islet, Queensland. Holotype in Austr. Mus., Sydney.

Three specimens from Darnley Island, 6 Oct. 1912; collected by J. R. Tosh. (Qld. Mus. Regd. No. *I. 812.*) Twelve from Masthead Island, collected by H. A. Longman. (Q.M. No. *I. 757.*)

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[35] Bleeker, Atl. Ichth. vi, 1877, pl. cccvi, fig. 6 only.

[36] Regan, Proc. Zool. Soc. Lond. 1913, ii, p. 370, pl. lviii, fig. 1.

[37] Fowler, Bish. Mus. Bull. xxxviii, 1927, p. 22.

Dischistodus fasciatus (Cuv. & Val.).

"*Prochilus No. 2 corpore angustiore in medio fascia lata*," &c., Klein, Miss. Pisc. v, 1749, p. 60, pl. xii, fig. 2 (*fide* Bleeker, 1877). Pre-Linnean.

Pomacentrus fasciatus Cuvier & Valenciennes, Hist. Nat. Poiss. v, July 1830, p. 426, pl. cxxxiv. Java. *Id.* Schlegel & Müller, Verh. Nat. Ges. Ned. overz, Pisc., 1844, p. 20, pl. iv, fig. 1. *Id.* Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 19. *Id.* Klunzinger, Sitzb. Akad. Wiss. Wien lxxx, 1, 1879, p. 397.

Dischistodus fasciatus Bleeker, Atl. Ichth. ix, 1877, pl. cccci, fig. 8 and Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 86.

Pomacentrus quadrifasciatus Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 87, in synonymy. *Ex* Kuhl & van Hasselt, MS.

Pomacentrus (*Dischistodus*) *fasciatus* Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, pp. 67 & 111 (references).

One from Moreton Bay presented by the Amateur Fishermen's Association of Queensland. (Qld. Mus. Regd. No. *I. 2189.*) Klunzinger (1879) recorded this species from Port Darwin, but this is the first record of its occurrence in Queensland. Other specimens collected by J. Colclough at Dobo, Aru Islands, are in the A. F. A. Q. Museum, Brisbane (Nos. *1168-1169*).

The name *Pomacentrus quadrifasciatus* was evidently written on a drawing by Kuhl and van Hasselt, who collected the species in Java about a century ago. Their name, however, was not utilised by Cuvier & Valenciennes nor by Schlegel & Müller who described the species as *Pomacentrus fasciatus*. Kuhl & van Hasselt's name was published in the synonymy of *P. fasciatus* by Bleeker (1877) and is a *nomen nudum* and an absolute synonym of *P. fasciatus*.

Pomacentrus (*Dischistodus*) *fasciatus* var. *intermedia* Weber,[38] from the Philippine Islands, may apparently be maintained as a distinct variety.

Dischistodus frenatus (De Vis).

(Text-figure 3.)

Pomacentrus frenatus De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 874. Cardwell, Queensland. Type in Qld. Mus. examined. *Id.* McCulloch & Whitley, Mem. Qld. Mus. viii, 1925, p. 166.

Re-description of Pomacentrus frenatus De Vis.

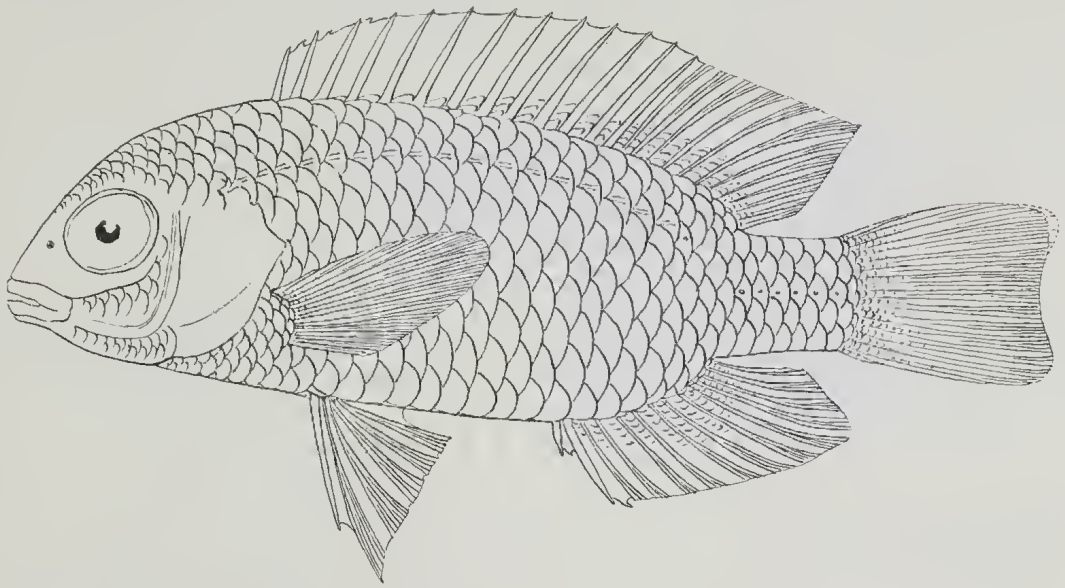
D.xiii/15; A.ii/14; P.i/16; V.i/5; C.15. Sc.24. L.tr.3/1/8; 17 tubes on L.lat. plus 7 punctured scales on caudal peduncle.

Head (31 mm.) 3·2 in length to hypural joint (101). Depth of body (46) 2·2, and depth of caudal peduncle (17) 5·9 in same. Eye (8) 3·8, interorbital (9) 3·4, preorbital (7) 4·4, snout (9·5) 3·2 in head. Last dorsal spine, 17 mm.; eighth dorsal ray, 24; second anal spine, 13; and ninth anal ray, 22.

Profiles of head markedly convex, the upper much more so than the lower. Scales cover the interorbital area but the frons, preorbital, and suborbitals are naked. Three rows of large scales and two of small ones on the cheeks. Preorbital deep, without notch. Suborbital and ascending limb of preoperculum evenly and strongly

[38] Weber, Siboga-Exped., Fische, May 1913, p. 340, pl. vi, fig. 4. Sulu.

dentieulated; other opereular margins entire. Interorbital eonvex. Maxillary reaehing vertieal of anterior margin of eye. Conic teeth in eaeh jaw.



Text-fig. 3.—*Iredaleichthys pallidus* (De Vis). Holotype of *Glyphidodon pallidus* De Vis from Banks Group, Melanesia.
G. P. Whitley, del.

Body robust, the dorsal profile well arehed. Caudal pedunele deep. The seales are large and regular and extend a little way onto the fins exeepting the ventrals. Lateral line gently eurved, its seales without notehed margins.

Dorsal originating over the opereular flap, well in advanee of the vertieal of the insertion of the ventrals. The anterior spines are shorter than those following them and the membranes are produeed into free pencils. The soft dorsal forms a pointed lobe and terminates a little behind the termination of the anal. Anal similar in form to soft dorsal but not so high and with a longer base. Peetorals rounded. Ventrals reaching vent. Caudal apparently bilobed.

Colour, after long preservation in formalin, uniform straw-yellowish. Originally deseribed as—"Colour pale yellowish green. Between the eyes two transverse lines curving strongly forward. On the cheek two straight lines from the upper part of the preoperele to the angle of the mouth and a line of spots below them. Operele with spots, dashes, and eurved streaks. Scales of the body below the lateral line eaeh with a vertieal line on the base extending to the scales above and below it. On the scales above the lateral line posteriorly, small round spots extending a little on the base of the soft dorsal. Base of eaudal and peetoral similarly spotted. A very obseure brown pateh on the base of the first four dorsal rays. A dark-brown axillary spot and an obseure bluish spot on the origin of the lateral line."

Deseribed and figured from the holotype of *Pomacentrus frenatus* De Vis, a speeimen 101 mm. long from snout to hypural joint. (Qld. Mus. Regd. No. *I. 13/1366.*)

Locality.—Cardwell, North Queensland; eolleeted by Kendall Broadbent.

Eupomacentrus nigricans (Lacépède) var. subniger (De Vis).

Holocentrus nigricans Lacépède, Hist. Nat. Poiss. iv, 1802, pp. 332 & 367. No locality. Ex "*Aspro totus atratus,*" &c. Commerson, MS. Probably from Mauritius.

Pomacentrus scolopseus Quoy & Gaimard, Voy. Uranie & Physic., Zool., 1825, p. 398. Mauritius.

Pomacentrus tæniops Cuvier & Valenciennes, Hist. Nat. Poiss. v, July 1830, p. 423. Mauritius.

Pomacentrus scolopsis Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 28. *Emend. pro P. scolopseus* Q. & G. *Id.* Günther, Journ. Mus. Godeff. xv (Fische Südsee vii), 1881, p. 227, pl. cxxv, fig. A (Samoa); copied by Lydekker, Roy. Nat. Hist. v, 1896, p. 418 & fig.

? *Pomacentrus scolopsis* Macleay, Proc. Linn. Soc. N. S. Wales ii, 1878, p. 361 (Port Darwin).

Pomacentrus subniger De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 873. Cardwell, Queensland. Holotype in Qld. Mus. examined.

Pomacentrus nigricans Jordan & Seale, Bull. U. S. Bur. Fish. xxv, 1906, p. 281. *Id.* McCulloch & Whitley, Mem. Qld. Mus. viii, 1925, p. 166. *Ex* De Vis. *Id.* Fowler & Bean, U. S. Nat. Mus. Bull. 100, vol. vii, 1928, p. 118.

Re-description of **Pomacentrus subniger** De Vis.

D.xii/16; A.ii/13; P.17; V.i/5; C.15. Sc.26 (De Vis' "Lat. 34" is evidently an error). L.tr. 3/1/8; 19 tubes on L.lat. plus about 8 punctured scales on caudal peduncle.

Head (29 mm.) 3·2 in length to hypural joint (93). Depth of body (45) 2·06, and depth of caudal peduncle (15) 6·18 in same. Eye (9) 3·2, interorbital (8) 3·6, preorbital (6) 4·8 in head.

Head scaly except for chin, mouth, and anterior part of preorbital. Two and a-half rows of scales on cheeks. No preorbital notch. Suborbital and preoperculum strongly and regularly denticulated, other opercles entire. A concealed opercular spine. Interorbital slightly convex. Maxillary almost reaching vertical of anterior margin of eye. A single series of compressed incisors in each jaw.

Body compressed, covered with large scales which extend onto all the fins except the ventrals. Lateral line scales with notched margins and small tubes. Dorsal originating immediately over the ventral spines and terminating slightly behind the anal. The spines are long, but not so high as the longest rays of the soft portion of the fin. Anal spines strong, soft portion of fin apparently similar to that of dorsal, but with a shorter base. Pectorals rounded, upper rays longest. Ventrals reaching vent when adpressed. Caudal bilobed.

Colour, after long preservation in formalin, fairly uniform olive brownish; fins lighter; a small spot at end of soft dorsal. De Vis stated "Colour murky black. Scales with some obscure pearly markings."

Described from the holotype of *Pomacentrus subniger* De Vis, a specimen 93 mm. long from snout to hypural joint. (Qld. Mus. Regd. No. *I. 11/80.*)

Locality.—Cardwell, North Queensland; collected by Kendall Broadbent.

Remarks.—In July 1917, the late A. R. McCulloch made the following MS. note:—"The type of *P. subniger* De Vis is preserved in the Qld. Mus. . . . Ogilby identifies it with *P. nigricans* Laceep., of which *P. scolopsis* as figured by Günther,

Fisch. Sudsee, pl. 125, fig. A is considered to be a synonym. De Vis' specimen agrees in detail with Günther's figure, and undoubtedly represents the same species, though I count only 28 scales between the origin of the lateral line and the hypural joint, 19 bearing tubules. D.12/16. A.2/13."

Hawaiian specimens identified by various authors as *Pomacentrus nigricans* are apparently referable to *Eupomacentrus marginatus* Jenkins[39] which has thirteen dorsal spines. Since Jenkins's species is not congeneric with *Pomacentrus marginatus* Rüppell,[40] a species of *Pellochromis*, there seems to be no reason for using the substitute name *Pomacentrus jenkinsi* proposed for it by Jordan & Evermann.[41]

Eupomacentrus paschalis, nom. nov.

Pomacentrus inornatus Regan, Proc. Zool. Soc. Lond. 1913, ii (Sept. 1913), p. 370, pl. lviii, fig. 1. Easter Island. *Id.* Rendahl, N. Hist. Juan Fernandez & Easter I. iii, 1920, p. 60. Not *Pomacentrus inornatus* Jordan & Seale = *Pseudopomacentrus niomatus* (De Vis).

Pomacentrus jenkinsi Kendall & Radcliffe, Mem. Mus. Comp. Zool. Harv. xxxv, 3, 1912, p. 132. Easter Island specimens. Not *P. jenkinsi* Jordan & Evermann, Bull. U. S. Fish. Comm. xxii, 1903, p. 189; *ibid.* xxiii, 1, 1905, p. 270, fig. 115, from Hawaii = *Eupomacentrus marginatus* Jenkins.

Regan's identification of *Pomacentrus inornatus* De Vis from Easter Island was incorrect, as a comparison of his figure with my sketch of De Vis' type will show. *P. niomatus* De Vis is doubtless a misprint for *P. inornatus* but I have retained the original spelling in this paper.

As the Easter Island species appears to be new, although allied to *Eupomacentrus marginatus* Jenkins[42] from Hawaii, I name it *Eupomacentrus paschalis.*

Sub-family GLYPHISODONTINÆ.

"*Glyphisodia*" Rafinesque, Anal. Nat. 1815 (*fide* Agassiz, Nom. syst. gen. Pisc., 1842, p. 27).

NEGOSTEGASTES, gen. nov.

Orthotype.—*Glyphisodon leucozona* Bleeker.[43]

Body oblong. Inferior pharyngeal bone triangular. Snout scaly above or entirely scaly. Scales on the preoperculum, above the scaly inferior limb, in three or four longitudinal series. About fourteen longitudinal series of scales on the body; 2 or $2\frac{1}{2}$ rows between the lateral line and the scaly sheath of the dorsal below the last spine. Twelve dorsal spines. Caudal slightly emarginate.

The name *Stegastes* was proposed by Jenyns[44] for *S. imbricatus* from the Cape Verde Islands. Bleeker[45] used Jenyns' name for a subgenus of *Glyphisodon* and gave a definition which disagrees with Jenyns' account in the proportions and shape

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[39] Jenkins, Bull. U. S. Fish. Comm. xix, June 8, 1901, p. 391, fig. 5. Honolulu.

[40] Rüppell, Atlas zu Rüppell, Reise (Senckenb. Nat. Ges.), Fische, 1829, p. 38, pl. viii, fig. 2. Massowah, Red Sea.

[41] Jordan & Evermann, Bull. U. S. Fish. Comm. xxii, April 11, 1903, p. 189. Honolulu.

[42] Jenkins, Bull. U. S. Fish. Comm. xix, June 8, 1901, p. 391, fig. 5.

[43] Bleeker, Nat. Tijdschr. Ned. Ind., xix, 1859, p. 339. Karangbollong, Java.

[44] Jenyns, Zool. Voy. Beagle, 1840, p. 62.

[45] Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 92.

of the unpaired fins. *Stegastes*, in the sense used by Bleeker (*non* Jenyns), included *Glyphidodon lacrymatus*, *G. leucozona*, *G. batjanensis*, and *G. dickii*, all of which have 13 or 14 longitudinal rows of body-scales and the suborbital and inferior preopercular limb scaly. Fowler & Bean,[46] following Bleeker, added *Abudefduf azurepunctatus* to this group.

Jenyns however stated that vomerine and palatine teeth are present in *Stegastes*, and this feature, combined with the different shapes of the unpaired fins, and the denticulated preoperculum, shows that *Stegastes* cannot be applied to the very different Glyphisodontine forms.

I accordingly propose the new generic name *Negostegastes* for *Glyphisodon leucozona* Bleeker and its allies mentioned by Bleeker, including also *Abudefduf azurepunctatus* Fowler & Bean.

Glyphidodontops amabilis (De Vis).

Glyphidodon amabilis De Vis, Proc. Linn. Soc. N. S. Wales viii, 4, Feb. 21, 1884, p. 452. South Sea Islands.

Abudefduf amabilis Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 177 (references and synonymy).

One specimen from Murray Island, Torres Strait, was collected by Mr. Melbourne Ward recently. (Austr. Mus. Regd. No. *Ia. 3719.*)

New record for Australia. This species is very closely allied to *G. albofasciatus* Hombron & Jacquinot,[47] from Borneo.

Glyphidodontops unimaculatus (C. & V.).

Glyphisodon unimaculatus Cuvier & Valenciennes, Hist. Nat. Poiss. v, July 1830, p. 478. Timor. *Id.* Schlegel & Müller, Verh. Nat. Ges. Ned. overz, Pisc., 1844, p. 23, pl. vi, fig. 1.

Glyphidodontops leucogaster Bleeker, Atl. Ichth. ix, 1877, pl. ccccvii. fig. 5 (not 6 as in legend at foot of plate). East Indies. Not *Glyphisodon leucogaster* Bleeker, s.str. (Nat. Geneesk. Arch. Neerland's-Indie, iv, 2, 1846, p. 156.)

Glyphidodontops unimaculatus Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 140.

Abudefduf unimaculatus Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 145.

One specimen from Murray Island, collected by Mr. M. Ward. (Austr. Mus. Regd. No. *Ia. 3720.*) New record for Australia.

Genus IREDALEICHTHYS Whitley.

Chrysiptera Swainson, Nat. Hist. Classif. Fish. Amphib. Rept. ii, July 1839, pp. 171 & 216. Preoccupied by *Chrysopterus* Swainson 1836 and *Chrysoptera* Zincken 1817. Emended to *Chrysoptera* by Agassiz. Logotype, selected by Swain, Proc. Acad. Nat. Sci. Philad. 1882 (1883), p. 273, *Chrysiptera azurea* Swainson = *Glyphisodon cyaneus* Quoy & Gaimard.

Iredaleichthys Whitley, Rec. Austr. Mus. xvi, 6, June 11, 1928, p. 296. Substitute for *Chrysiptera* Swainson, preocc. Orthotype, *C. azurea* Swainson = *Glyphisodon cyancus* Quoy & Gaimard.

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[46] Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 123.

[47] Hombron & Jacquinot, Voy. Pole Sud., Zool. iii, Poiss. 1853, p. 49, pl. v, fig. 4.

Iredaleichthys (type, *Glyphisodon cyaneus* Q. & G.) is allied to *Glyphidodontops* Bleeker[48] (type, *Glyphisodon antjerius* C. & V.—*fide* Jordan), but though *Glyphidodontops* was regarded as a substitute for *Chrysiptera* Swainson by Bleeker[49] he also stated, " Ce genre, bien que synonyme de Chrysiptera Swns., est tout autrement caractérisé ici que par Swainson." In Bleeker's key to the species, *Glyphidodontops cyaneus* Bleeker enters the section " Dents pharyngiennes en partie obtuses," i.e. *Iredaleichthys*, whilst *G. antjerius*, the true *Glyphidodontops*, has " Dents pharyngiennes toutes pointues," &c. These characters appear to be of at least subgeneric importance and I therefore retain the two names as distinct. Fowler & Bean[50] have shown that *Glyphidodontops cyaneus* Bleeker is not identical with *Glyphisodon cyaneus* Quoy & Gaimard and have renamed it *Abudefduf bleekeri*.

Iredaleichthys pallidus (De Vis).

(Text-figure 4.)

Glyp[h]idodon pallidus De Vis, Proc. Linn. Soc. N. S. Wales viii, 4, Feb. 21, 1884, p. 452. Banks Group. Type in Queensland Museum examined.

Abudefduf pallidus Jordan & Seale, Bull. U. S. Bur. Fish. xxv, 1906, p. 286. " New Guinea." *Ex* De Vis.

D.xiii/12; A.ii/12; P.17; V.i/5; C.15. Sc.24. 17 tubes on L.lat. L.tr. c.11.

Head (13 mm.) 3·3 in length to hypural joint (43); depth of body (15·5) 2·7, and depth of caudal peduncle (6) 7·1 in same. Interorbital (3·5) equal to snout (3·5) and 3·7 in head. Eye (5) 2·6 in head.

Upper profile roundly convex, the lower sloping downwards and backwards almost in a straight line to anal. Head scaly, except for the snout before the interorbital and the narrow suborbital. Eye large, its diameter longer than the width of the convex interorbital area. All opercles entire. Maxillary reaching to below anterior third of eye. A single series of compressed teeth in each jaw.

Body elongate, compressed, entirely covered with scales which extend a short distance onto the fins. About 14 predorsal scales. The lateral line extends to below the soft dorsal and bears 17 tubes; some punctured scales follow these and a row of them extends along the caudal peduncle.

Dorsal originating slightly in advance of the vertical of the origin of the pectoral and terminating a little behind the anal. The spines increase in height posteriorly and the rays of the soft portion form a pointed lobe. Anal similar to soft dorsal but with longer rays. The membranes of the anal and anterior dorsal spines appear to be produced into pencils. Pectorals rounded, shorter than head. Ventrals pointed, their first rays reaching a trifle beyond the vent. Caudal lobes rounded, the lower longer.

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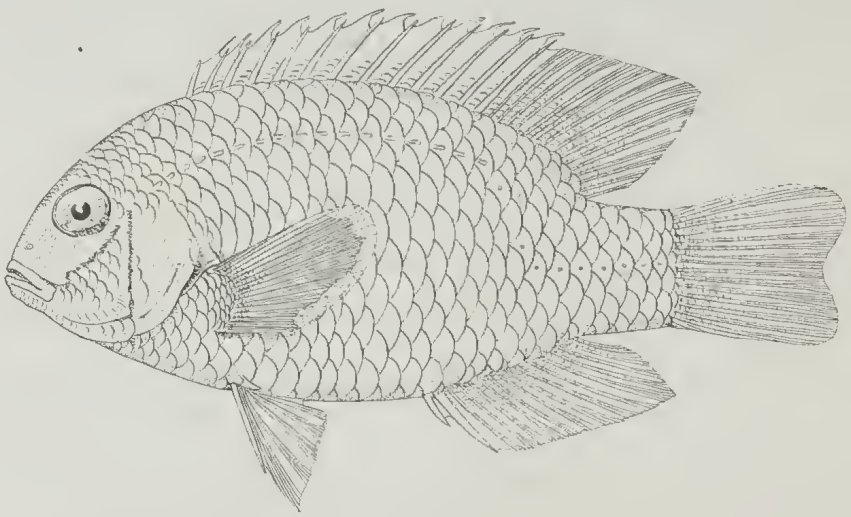
[48] Bleeker, Arch. Néerl. Sci. Nat. xii, 1877, p. 41. Orthotype, *Glyphidodon antjerius* (Cuv. & Val.) Bleeker. *Fide* Jordan, Gen. Fish. iii, 1919, p. 387.

[49] Bleeker, Nat. Verhand. Holland. Maatsch. Wetensch. (3) ii, 6, 1877, p. 128. I did not possess this work when the genus *Iredaleichthys* was proposed but since obtained it from Holland.

[50] Fowler & Bean, U. S. Nat. Mus. Bull. 100, vol. vii, 1928, pp. 124 & 165. Timor and Philippine Islands.

The type of *Glyphidodon pallidus* has now faded to a uniform straw yellow colour with the vent brown. De Vis gave its colours as—"Pale yellowish blue; a blue line from base of dorsal to muzzle on each side. Two curved lines beneath the eye; small oval spots or short streaks above lateral line, and extending upon the webs of the dorsal; streaks on a few scales below the lateral line."

Described and figured from the holotype of *Glyphidodon pallidus* De Vis, a specimen 43 mm. in length to hypural joint. (Qld. Mus. Regd. No. *I.13/1353.*)



Text-fig. 4.—*Dischistodus frenatus* (De Vis). Holotype of *Pomacentrus frenatus* De Vis from Cardwell, Queensland.

G. P. Whitley, del.

Locality.—Banks Group, collected by C. F. Browne. This is probably the Banks Group between the New Hebrides and the Santa Cruz Islands and not Banks Island in Torres Strait, Queensland. Jordan & Seale (*loc. cit.*) give New Guinea as the locality for this species.

Affinities.—*Glyphidodon pallidus* De Vis is regarded by Fowler & Bean[51] as a synonym of *Abudefduf glaucus* (C. & V.) with *Glyphisodon modestus* Bleeker and *G. phaiosoma* Bleeker as further synonyms. I am not entirely convinced that this is correct and consequently use De Vis' name for the present species. *Iredaleichthys pallidus* is very closely allied to *Glyphisodon glaucus* C. &. V., *G. cyaneus* Quoy & Gaimard, and *Abudefduf bleekeri* Fowler & Bean. Other species which apparently must be grouped with *Glyphidodon pallidus* in the genus *Iredaleichthys* are *Glyphidodon modestus* Schlegel & Müller, *G. uniocellatus* Quoy & Gaimard, *G. hedleyi* Whitley, *Abudefduf sapphirus* Jordan & Richardson, *A. turchesius* Jordan & Seale, and *A. hemicyaneus* Weber.

Sub-family PARMINÆ.

Parma mccullochi sp. nov.

Hypsipops microlepis Waite, Rec. Austr. Mus. vi. 2, Sept. 15, 1905, pp. 67-69. *Idem.*, Alexander, Journ. Linn. Soc. Lond., Zool., xxxiv, 1922, p. 428. Houtmans Abrolhos specimens only. Not *Parma microlepis* Günther 1862.

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[51] Fowler & Bean, U. S. Nat. Mus. Bull. 100, vol. vii, 1928, p. 169.

D.xiii/18 ; A.ii/14 ; P.i/20 ; V.i/5 ; C.13. L.lat. with 29 tubes and about 8 punctured scales. L.tr. 6/1/13.

Head (35·5 mm.) 3·1 in length to hypural joint (112). Depth of body (65) 1·7, and depth of caudal peduncle (21) 5·3 in same. Eye (10) 1·3 in interorbit (13) and 3·5 in head.

Upper profile of head steep, convex ; lower similar but less steep. Head much higher than long, much longer than broad. Eye rather large. All opercles entire. Preorbital margin slightly excavated though not definitely notched. Jaws subequal, lips fleshy. Maxillary not reaching vertical of eye. A single series of small compressed teeth in each jaw. Gill-membranes united across isthmus. Head densely scaled except anteriorly, around mouth, on chin and anterior half of suborbital, where there are naked areas with scattered pores. Auxiliary scales, many of them rudimentary, on top of head and sides of nape.

Body ovate, compressed, covered with small ciliated scales which are largest on anterior portions of sides and extend to the distal portions of all the unpaired fins, forming dense sheaths ; they cover the basal part of the pectoral and extend along some of its membranes, but there are no scales on the ventrals. Lateral line well arched, its tube-bearing scales with lobe-like edges. Vent before the anal fin, with a minute papilla.

Dorsal originating in advance of pectorals and ventrals and terminating behind anal. Membranes of first dorsal produced into little pencils. Fourth to ninth spines longest, subequal. Soft dorsal high, pointed, the seventh and eighth rays longest, the last minute and divided. Anal spine longer than any of the dorsal spines and very strong ; anal fin lower and shorter than soft dorsal, the seventh ray longest and the last short and divided. Pectoral somewhat pointed, longer than head, slightly shorter than ventrals whose first rays are filamentous and reaching anal fin. Caudal lobes rounded, the upper longer.

Colour, after long preservation in alcohol, fairly uniform brown, a little darker on all the fins except the pectorals, which are lighter. No white opercular patch. Described from the holotype, a unique specimen, 112 mm. in length to hypural joint, or 6 inches in total length. (Austr. Mus. Regd. No. *I. 13144*, originally labelled "*Parma microlepis*, var.")

Locality.—Rottnest Island, West Australia. Presented by the Fisheries Department of West Australia.

Named in honour of the late A. R. McCulloch, who drew, whilst still in his teens, the accurate and beautiful figures of the allied *Parma microlepis* showing its variations with growth.[52]

Parma mccullochi is the western congener of *P. microlepis* Günther,[53] apparently differing from that species by having a more declivous profile, smaller scales, and longer pectorals.

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[52] In Waite, Rec. Austr. Mus. vi, 2, 1905, p. 67, pl. xii.

[53] Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 57. Port Jackson (young) ; and *ibid.* p. 58. "Australia" (adult, as *Parma squamipinnis*).

Parma oligolepis sp. nov.

(Pl. xxviii, fig. 1.)

Hypsipops polylepis Ogilby, Commerc. Fish. Fisher. Qld. 1915, p. 55. Moreton Bay. Not *Parma polylepis* Günther 1862.

Parma polylepis McCulloch & Whitley, Mem. Qld. Mus. viii, 2, 1925, p. 166.

D.xiii/19; A.ii/15; P.i/20; V.i/5; C.13. 23 tubes on l.lat. plus about 7 punctured scales. L.tr. 4/1/13.

Head (49 mm.) 3·3 in length to hypural joint (166). Depth of body (93) 1·7, and depth of caudal peduncle (26) 6·3 in same. Eye (12) equal to its distance from tip of preorbital process (12), 1·5 in interorbital width (18) and 4·0 in head.

Upper profile of head evenly sloping, the lower profile convexly rounded. Head higher than long and longer than broad. Eye small. All opercles entire. Preorbital forming a broad process. Jaws subequal with thick lips. Maxillary not reaching vertical of anterior margin of eye. A single series of compressed teeth in each jaw. Five branchiostegal rays. Gill-membranes united across isthmus. Eleven gill-rakers on the lower limb of the first branchial arch, the median ones longest. Head scaly except for an area before the eyes, around the mouth, and along the preoperenlar margin. Some scales on the nape have small auxiliary scales between them, a rare feature in Australian Pomacentrids.

Body ovate, compressed, covered with ciliated scales which are largest on the sides, and extend onto all the fins except the ventrals. The scales form dense sheaths at the bases of the unpaired fins and extend in rows between the rays; minute scales also cover the proximal portions of the rays themselves. No scales on membrane between caudal lobes. Lateral line gently arched, composed of 23 tube-bearing scales followed by a row of punctured scales on the side of the caudal peduncle. The lateral line scales each have a rounded median lobe. Genital papilla present.

Dorsal originating over the base of the pectoral and terminating a little behind the termination of the anal. The seventh to ninth spines are the longest. Soft dorsal high, pointed; seventh and eighth rays longest. Anal similar to soft dorsal but with a rounded margin. Pectorals nearly as long as the head. Ventrals pointed, reaching the vent. Caudal lobes rounded.

Colour, after preservation in formalin, fairly uniform brown, somewhat darker on the borders of the fins and the margins of the scales on the body.

Described and figured from the holotype, a specimen 166 mm. in length to hypural joint. (Qld. Mus. Regd. No. *I.2536*.)

Locality.—Cape Moreton, near Brisbane, Queensland.

Variation.—Two other specimens in the Queensland Museum show no important variation. No. *I.3429* from Bundaberg has D.xiii/20; A.ii/15; P.ii/19; L.lat. 22 tubes; Sc.28; L.tr. 4/1/15: and No. *I.2171* from Green Island has D.xiii/19; A.ii/14; P.ii/18; L.lat. 23 tubes; Sc.29; L.tr. 4/1/13.

Range.—Queensland; probably a coastal species.

Parma oligolepis is readily distinguished from its congeners by its larger and fewer scales (29 or less transverse rows between opercnlum and hypural joint) and deep body.

Parma viola sp. nov.

(Plate xxviii, fig. 2.)

D.xiii/16 ; A.ii/16 ; P.i/20 ; V.i/5 ; C.13. 22 tubes on L.lat. and about 9 punctured scales. L.tr. 4/1/12.

Head (50 mm.) 3·4 in length to hypural joint (170). Depth of body (94) 1·8, and depth of caudal peduncle (30) 5·7 in same. Eye (11) 2 in interorbital (22) and 4·5 in head.

Upper profile of head roundly convex. Head higher than long and longer than broad. Eye moderate. All opercles entire. Preorbital margin sinuous but not notched and without process. Jaws subequal, lips fleshy. Maxillary not reaching vertical of eye. A single series of small compressed teeth in each jaw. Tongue small. Five branchiostegal rays. Gill-membranes united across isthmus. About eleven short, pointed gill-rakers on the lower limb of the first gill-arch. Head scaly, except on frons, preorbital, chin, and margins of preoperculum where the scales are replaced by numerous large pores. Top of head, sides of nape, and an area behind the preopercular border thickly overlaid with auxiliary scales. Two small patches of minute scales on the median part of the gill-membranes.

Body elongate ovate, compressed, covered with ciliated scales which are largest on the anterior portion of the sides and extend on to all the fins except the ventrals ; they form sheaths for the dorsal and anal fins but only extend a little over halfway along the rays. The caudal is scaly almost to the tips of the rays and there are scales on the small membrane between the lobes. Lateral line gently arched, composed of twenty-two tube-bearing scales followed by eight or nine punctured scales on side of caudal pedunele. Most of the tube-bearing scales have irregular outlines, often with median lobes. Intestine long and large, the fish evidently subsisting on seaweeds.

Dorsal originating in advance of pectorals and ventrals, terminating behind anal. Membranes of the spinous portion produced into pencils. Fourth and fifth dorsal spines longest ; of the rays, the sixth is longest, reaching to the tip of the pointed lobe of the soft dorsal fin. Anal somewhat similar to soft dorsal but lower and with a rounded margin ; eighth and ninth rays longest. Pectorals longer than head. Ventrals pointed, not reaching vent. Caudal lobes rounded, the upper longer.

Colour, after long preservation in alcohol, fairly uniform chocolate-brown with traces of violet tinges on the bases of the pectorals and on parts of the head ; from these the specific name is derived.

Described from the unique holotype, a specimen 170 mm. in length to hypural joint, or nearly 9 inches in total length. (Aust. Mus. Regd. No. *I.6611.*)

Locality.—Tasmania ; received by exchange from the Victoria Museum, Launceston, in 1904.

This novelty is allied to *Parma oligolepis* but differs in being more elongate, having many pores and auxiliary scales on head, longer pectorals and soft dorsal, shorter ventrals, different fin-formulæ, less scaly unpaired fins, notchless preorbital, larger eye, and in several minor characters mentioned in the description above. The holotype of *Parma viola* was labelled "*Glyphisodon victoriæ*" in the Australian Museum collection, but this identification was incorrect, as reference to Günther's

description[54] and McCulloch & Waite's figure[55] shows a generically separable fish now known as *Actinochromis victoriæ*. *Actinochromis* and *Parma* are evidently closely related genera, however, and may be segregated from the other Pomacentridæ by being placed in a sub-family to be called the Parminæ.

Genus ACTINOCHROMIS Bleeker.

In Jordan's "Classification of Fishes," 1923, p. 218 and footnote no. 442, there is included in the Pomacentridæ the genus "*Actinochromis*. Orthotype *A. lividus*. (Further details lacking.)" This name, which has been overlooked by most ichthyologists and nomenclators, was proposed by Bleeker in his "Mémoire sur les Chromides Marins ou Pomacentroïdes de l'Inde Archipélagique" (Natuurk. Verhand. Holl. Maatsch. Wetensch., 3de Verz. Deel ii, No. 6; Harlem, 1877) which appears to have been issued after the ninth volume of the Atlas Ichthyologique and therefore posthumously. On pages 5-6 of that paper, we read: "Le Heliastes lividus Steind. seul semble génériquement distinct par les dents unisériales et obtuses, par le museau et les préorbitaires sans écailles, et par une dorsale à 18 et une anale à 15 ou 16 rayons. On pourrait indiquer ce type sous le nom d'Acanthochromis." The last word is evidently a *lapsus calami*, and is not to be confused with the genus *Acanthochromis* Gill. Bleeker corrected his error on page 166 of the same treatise where, in the "Corrigenda et Addenda" is stated "Pag. 6 Lin. 3 loco: Acanthochromis lege: Actinochromis." It is noted on page 39 of the same paper that *Actinochromis* belongs to the phalanx Glyphidodontini, and on page 42 it is placed in the subphalanx Chromidi, "l'Actinochromis étant australasien."

The orthotype of *Actinochromis* is *Heliastes lividus* Klunzinger (not of Steindachner as stated by Bleeker). This species was described from Port Phillip, Victoria, in Weigmann's Archiv. Naturg. xxxviii, 1, 1872, p. 36, but, being conspecific with the earlier *Glyphidodon victoriæ* Günther,[56] must now be known as *Actinochromis victoriæ* (Günther). This species, or one very near it, has been described and figured by McCulloch & Waite[57] from a St. Vincent Gulf specimen. An old skin from Victoria, identified by Castelnau, is the only representative of this species I have seen. The Western Australian specimen noted by Klunzinger[58] is probably a second species of *Actinochromis* requiring description.

Fowler & Bean[59] have listed Bleeker's name as a synonym of *Chromis* Cuvier but this action is not justifiable; "*Chromis lividus* Steindachner" is given by them as genotype.

CHECK-LIST OF AUSTRALIAN SPECIES OF THE ORDER AMPHIPRIONIFORMES.

Family AMPHIPRIONIDÆ.

Genus AMPHIPRION Bloch & Schneider.

"*Coracinus*" Gronow, Zoophylacium 1763, p. 66. Non-binomial. Part referring to "*Coracinus fasciis latis obliquis*" &c. only. This species is *Coracinus* seu *Sciæna unimaculata* Meuschen, Index Zoophylac. Gronow, 1781.

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[54] Günther, Ann. Mag. Nat. Hist. (3) xi, Feb. 1, 1863, p. 115. Victoria.
[55] McCulloch & Waite, Rec. S. Austr. Mus. i, 1918, p. 46, pl. 11, fig. 2.
[56] Günther, Ann. Mag. Nat. Hist. (3) xi, Feb. 1, 1863, p. 115. Victoria.
[57] McCulloch & Waite, Rec. S. Austr. Mus. i, 1918, p. 46, pl. ii, fig. 2.
[58] Klunzinger, Sitzb. Akad. Wiss. Wien lxxx, 1, 1879, p. 398.
[59] Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 30.

Amphiprion Bloch & Schneider, Syst. Ichth. 1801, p. 200. Logotype, *A. ephippium* (Bloch), dosignated by Griffith, Anim. Kingdom (Cuvier), 1834, p. 160. Not *Amphiprion* Gistel, Naturg. d. Thierr. 1848, p. 108, which is made equivalent to *Anabas* Cuvier (i.e. *Amphiprion* Bl. & Schn., *pars, sed non sensu stricto*).

Amphiprionum Bosc, Nouv. Dict. d'Hist. Nat. (nouv. édit.) i, 1816, p. 469. *Idem*, Bory de St. Vincent, Dict. Class. d'Hist. Nat. i. 1822, p. 295. Variant of *Amphiprion*. Logotype, *A. ephippium* (Bloch), by present designation.

Prochilus Bleeker, Nat. Tijdschr. Dierk. ii, 1865, p. 360 ; Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 20 ; and Atl. Ichth. ix, 1877, on plates. *Ex* Klein, Neuer Schauplatz Natur. i, 1775, p. 1043, non-binomial (*fide* Jordan, Gen. Fish. i, 1917, p. 39 & *ibid.* ii, 1919, p. 168). Logotype, *Amphiprion ephippium* (Bloch), designated by Jordan, 1919. Preoccupied by *Prochilus* Cuvier, Règn. Anim. ed. 1, ii, " 1817 " = Dec. 1816, p. 294, another genus of fishes[60] ; not *Prochilus* Illiger, Syst. Mamm. et Avium, 1811, pp. 109-110 (*fide* Palmer, Index Gen. Mamm., 1904), a genus of mammals. Not *Prochilus* Brullé Hist. Nat. Ins. ix, 1835, p. 134), a genus of insects.

Amphiprion polymnus (Linnæus).

Perca polymna Linnæus, Syst. Nat., ed. 10, 1758, p. 291 ; ed. 12, 1766, p. 484. Habitat in Indiis.

Anthias polymna Bloch, Nat. Ausl. Fische vi, 1792, p. 103, pl. cccxvi, fig. 1. East Indies.

Range.—Queensland ; extralimital.

Amphiprion melanopus Bleeker.

Amphiprion melanopus Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 561. Amboina.

Amphiprion monofasciatus Thiollière, Ichth. in Montrouzier, Ann. Soc. Imp. d'Agric. &c., Lyons, viii, 1856 ; Faune Île Woodlark, 1857, p. 198. Woodlark Island.

Range.—North Australia[61] ; extralimital.

Amphiprion tricolor Günther.

Amphiprion tricolor Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 8. Port Essington. Types in British Museum.

Amphiprion ruppelii Castelnau, Proc. Zool. Acclim. Soc. Vict. ii, May 10, 1873, p. 91. Port Darwin. Type in Paris Museum.

Range.—North Australia ; extralimital.

Note.—Fowler & Bean (Bull. U. S. Nat. Mus. 100, vii, 1928, p. 10) note this speeies from Queensland, a mistake for North Australia.

Amphiprion bicinctus Rüppell.

Amphiprion bicinctus Rüppell, Atlas zu Rüppell, Reise (Senckenberg Nat. Ges.), Fische, 1830-1831, p. 139, pl. xxv, fig. 1. Tor and Massowah, Red Sea.

Range.—Queensland ; North Australia ; extralimital.

Amphiprion unimaculatus (Meuschen).

" *Jourdin*" Renard, Poiss. Moluques, 1718, pl. vii, fig. 49 (*fide* Gronow). Pre-linnean.

" *Coracinus fasciis latis* &c." Gronow, Zoophylacium 1763, p. 66, No. 227. Amboina and India. Non-binomial.

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[60] Cloquet (Dict. Sci. Nat., ed. Lovrault, xliii, 1826, p. 342) dosignates as the type of *Prochilus*, *Sciæna macrolepidota* and *S. maculata* Bloch, plates 298 & 299, allies of *Centropomus*.

[61] The term " North Australia" is here used for the State hitherto generally known as the " Northorn Territory" or " Northern Territory of South Australia," and does not include North Queensland and North-western Australia.

Coracinus seu *Scicena unimaculata* Meuschen, Index Zoophyl. Gronow, 1781, Pisces, No. 227. Based on Gronow, 1763.

Anthias bifasciatus Bloch, Nat. Ausl. Fische vi, 1792, p. 108, pl. cccxvi, fig. 2. Amboina.

Lutjanus jourdin Lacépède, Hist. Nat. Poiss. iv, 1802, pp. 191 & 235. Amboina. Probably derived from "Jourdin" Rénard.

Coracinus vittatus Gray, Cat. Fish. coll. Gronow Brit. Mus. 1854, p. 57. *Ex* Gronow MS. Based on Zoophylacium, No. 227.

Range.—Queensland ; extralimital.

NOTE.—This species has been generally called *Amphiprion bifasciatus* (Bloch) but Meuschen's name is earlier. Gronow's original name for this species was polynomial but Meuschen gave it the binomial name *Coracinus* s[eu] *Scicena unimaculata* in his Index to Gronow's Zoophylacium, a work published in 1781 in accordance with the Linnean system of nomenclature. Meuschen's names have been overlooked by many taxonomists owing to the rarity of his Index, a copy of which is in the Australian Museum library. The molluscan names have been listed by Dall[62] and I am preparing a collation of the fish names with a view to publication at a later date.

Amphiprion melanostolus Richardson.

Amphiprion melanostolus Richardson, Ann. Mag. Nat. Hist. ix, July 1, 1842, p. 390. Depuch Island, New Holland (Emery).

Range.—North-western Australia.

Amphiprion rubrocinctus Richardson.

Amphiprion ? rubrocinctus Richardson, Ann. Mag. Nat. Hist. ix, July 1, 1842, p. 391. Near Depuch Island (Emery).

Range.—North-western Australia.

Amphiprion papuensis Macleay.

Amphiprion papuensis Macleay, Proc. Linn. Soc. N. S. Wales viii, 3, July 1883, p. 271. D'Entrecasteaux Group. Type in Austr. Mus., Sydney.

Range.—Queensland and New Guinea.

Amphiprion milii (Bory de St. Vincent).

Sparus milii Bory de Saint Vincent, Dict. Classique d'Hist. Nat. xvii, 1831, p. 130, pl. xciii, fig. 2. Shark's Bay (Milius). Not *Sparus mylio* Lacépède, Hist. Nat. Poiss. iv, 1802, pp. 41 and 131 from Mauritius.

Range.—West Australia.

Genus ACTINICOLA Fowler.

Actinicola Fowler, Journ. Acad. Nat. Sci. Philad. (2) xii, 4, 1904, p. 533. Orthotype, *Lutjanus percula* Lacépède.

Actinicola percula (Lacépède).

Lutjanus percula Lacépède, Hist. Nat. Poiss. iv, 1802, p. 239. New Britain.

Amphiprion tunicatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 399. Vanicolo.

Amphiprion ocellaris Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 399. Sumatra.

Amphiprion melanurus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 400. Sumatra.

Range.—Queensland ; extralimital.

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[62] Dall, Nautilus xxxvii, Oct. 1923, pp. 44-52.

Actinicola bicolor (Castelnau).

Amphiprion bicolor Castelnau, Proc. Zool. Acclim. Soc. Vict. ii, May 10, 1873, p. 92. Port Darwin. Type in Paris Museum.

Range.—North Australia.

Family PREMNIDÆ.

Genus PREMNAS Cuvier.

Premnas Cuvier, Règn. Anim. ed. 1, i, "1817"= Dec. 1816, p. 345. Haplotype, *Chætodon biaculeatus* Bloch.

Premnas biaculeatus (Bloch).

Chætodon biaculeatus Bloch, Nat. Ausl. Fische iv, 1790, p. 11, pl. xxix, fig. 2. East Indies.

Lutianus trifasciatus Bloch & Schneider, Syst. Ichth., 1801, p. 568. Based on Koelreuter, Nov. Comm. Acad. Petropol. x, 1763, p. 346, pl. viii, fig. 5. Moluccas.

Scorpæna aculeata Lacépède, Hist. Nat. Poiss. iii, 1802, p. 268. No locality.

Holocentrus sonnerat Lacépède, Hist. Nat. Poiss. iv, 1802, pp. 344 & 391. Mauritius.

Chætodon bimaculatus Desmarest, Dict. Sci. Nat. (Levrault ed.), xliii, 1826, p. 279, pl. xlvii, fig. 2. No loc. *Errore pro C. biaculeatus*, designated type of *Premnas*. Not *Chætodon bimaculatus* Bloch 1790.

Premnas leucodesmus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 409. *Ex* Kuhl & van Hasselt MS. Java.

Premnas semicinctus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 409, pl. cxxxiii, fig. 1. No locality.

Premnas unicolor Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 410. Based on *Scorpæna aculeata* Lacépède 1802.

Sargus ensifer Gray, Cat. Fish. coll. Gronow Brit. Mus. 1854, p. 66. Indian Seas.

Premnas epigrammata Fowler, Journ. Acad. Nat. Sci. Philad. (2) xii, 1904, p. 532, pl. xix, lower figure to right. Padang, Sumatra.

A series collected by the late Charles Hedley at Green Island, off Cairns, and a specimen from Murray Island found inside a sea-anemone by Mr. Melbourne Ward, are in the Australian Museum. New record for Australia. For further references to this species see Fowler & Bean (Bull. U. S. Nat. Mus, 100, vii, 1928, p. 4); other recent notes have been given by Ahl (Blat. Aquar. Terr. xxxvii, 1926, p. 15).

Range.—Queensland; extralimital.

Premnas gibbosus Castelnau.

Premnas gibbosus Castelnau, Vict. Offic. Rec. Philad. Exhib. (Res. Fish. Austr.), 1875, p. 34. Cape York.

Range.—Queensland.

Family POMACENTRIDÆ, s. str.

Genus POMACENTRUS Lacépède.

Pomacentrus Lacépède, Hist. Nat. Poiss. iv, 1802, pp. 505 & 508. Logotype *P. pavo* Lacépède (= *Chætodon pavo* Gmelin), fixed by Guichenot, Dict. pittoresque d'Hist. Nat. viii, 1838-1839, p. 502.

Pristotis Rüppell, Neue Wirbelth. Abyssin., Fische, 1838, p. 128. Haplotype, *P. cyanostigma* Rüppell, called *cœruleopunctatus* on p. 129.

Pomacentrus tæniurus Bleeker.

Pomacentrus tæniurus Bleeker, Act. Soc. Sci. Indo-Néerl. (Verh. Natuurk. Verein. Ned. Ind.), i, 1856, p. 51. Amboina.

Pomacentrus cyanomos Bleeker, Nat. Tijdschr. Ned. Ind. xi, 1856, p. 89. Batavia.

Glyphisodon amboinensis Bleeker, Act. Soc. Sci. Indo-Néerl. ii, 1857, p. 72. Amboina.

Pomacentrus leucosphyrus Fowler, Journ. Acad. Nat. Sci. Philad. (2) xii, 1904, p. 533, pl. xix, lower fig. to left. Padang, Sumatra.

Range.—Queensland ; extralimital.

Genus DISCHISTODUS Gill.

Dischistodus Gill, Proc. Acad. Nat. Sci. Philad. xv, 1863, pp. 214 & 219. Orthotype, *Pomacentrus fasciatus* Cuv. & Val.

Dischistodus fasciatus (Cuv. & Val.).

Pomacentrus fasciatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 426, pl. cxxxiv. Java.

Pomacentrus quadrifasciatus Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 87, in synonymy. *Ex* Kuhl & van Hasselt MS. Java.

Range.—Queensland ; North Australia ; extralimital.

Dischistodus prosopotænia (Bleeker).

Pomacentrus prosopotænia Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 67. Singapore.

Pomacentrus interorbitalis Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 30. East Indian Archipelago.

Range.—Queensland ; extralimital.

Dischistodus frenatus (De Vis).

Pomacentrus frenatus De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 874. Cardwell. Type in Queensland Museum.

Range.—Queensland.

Genus PSEUDOPOMACENTRUS Bleeker.

Pseudopomacentrus Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 41. Logotype, *Pomacentrus littoralis* Cuv. & Val., designated by Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 65.

Pseudopomacentrus littoralis (Cuv. & Val.).

? *Pomacentrus emarginatus* Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 422. Waigiou.

Pomacentrus littoralis Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 425. *Ex* Kuhl & van Hasselt MS. Java.

? *Pristotis fuscus* Bleeker, Verh. Bat. Gen. xxii, 1849, Bali, p. 9. Bali, E. Indies.

Pomacentrus hogoleuensis Hombron & Jacquinot, Voy. Pole Sud. Zool. iii, Poiss., 1853, p. 47, pl. v, fig. 3. Hogoleu, Caroline Is.

Range.—Queensland ; North Australia ; extralimital.

Pseudopomacentrus macleayi (Whitley).

Pomacentrus obscurus Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales i, 4. 1877, p. 343, pl. xv, fig. 2. (Torres Strait.) Preoccupied by *Pomacentrus obscurus* Thiollière, Ichth. in Montrouzier, Ann. Soc. Imp. d'Agric. &c., Lyons, viii, 1856 (Faune Île Woodlark, 1857), p. 200.

Pomacentrus macleayi Whitley, Rec. Austr. Mus. xvi, 4, March 28, 1928, p. 221. New name for *P. obscurus* Alleyne & Macleay, preoccupied.

Range.—Queensland.

Pseudopomacentrus wardi (Whitley).

Pomacentrus wardi Whitley, Rec. Austr. Mus. xv, 5, April 6, 1927, p. 301, fig. 1. Heron I., Queensland. Holotype and paratypes in Austr. Mus., Sydney.

Range.—Queensland ; North Australia ; extralimital.

NOTE.—Records of *Pomacentrus trilineatus* from Australia apparently refer to this species.

Pseudopomacentrus bilineatus (Castelnau).

Pomacentrus bilineatus Castelnau, Proc. Zool. Acclim. Soc. Vict. ii, May 10, 1873, p. 89. Port Darwin.

Range.—North Australia.

Pseudopomacentrus modestus (Castelnau).

Pomacentrus modestus Castelnau, Vict. Offic. Rec. Philad. Exhib. (Res. Fish. Austr.), 1875, p. 35. Gulf of Carpentaria.

Range.—Queensland.

Pseudopomacentrus flavicauda (Whitley).

Pomacentrus flavicauda Whitley, Rec. Austr. Mus. xvi, 6, June 11, 1928, p. 297, fig. 1. North west Islet, Queensland. Type in Austr. Mus., Sydney.

Range.—Queensland ; North Australia.

Pseudopomacentrus fasciatus (Macleay).

Dascyllus fasciatus Macleay, Proc. Linn. Soc. N. S. Wales ii, 4, June 1878, p. 361, pl. x, fig. 2. Port Darwin. Type in Macleay Mus., University of Sydney.

Pomacentrus darwinicnsis Whitley, Rec. Austr. Mus. xvi, 6, June 11, 1928, p. 297. New name for *Dascyllus fasciatus* Macleay, regarded as invalidated by *Pomacentrus fasciatus* Cuv. & Val., 1830.

Range.—North Australia.

Pseudopomacentrus sufflavus (Whitley).

Pomacentrus sufflavus Whitley, Rec. Austr. Mus. xvi, 1, Oct. 7, 1927, p. 18, pl. i, fig. 3. Michaelmas Cay, N. Queensland. Holotype in Austr. Mus., Sydney.

Range.—Queensland.

Pseudopomacentrus amboinensis (Bleeker).

Pomacentrus amboinensis Bleeker, Versl. Akad. Amsterdam (2) ii, 1868, p. 334. Amboina.

NOTE.—Specimens in the Australian Museum from Holbourne Island, off Port Denison, North Queensland, were collected by Mr. E. H. Rainford, and agree excellently with the original description by Bleeker and with the figure published later (Bleeker, Atlas Ichth., ix, 1877, pl. ccccvi, fig. 7).

New record for Australia.

Range.—Queensland ; extralimital.

Pseudopomacentrus apicalis (De Vis).

Pomacentrus apicalis De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 874. Barrier Reef, Queensland. Type in Queensland Museum.

Range.—Queensland.

Pseudopomacentrus bankanensis (Bleeker).

Pomacentrus bankanensis Bleeker, Nat. Tijdschr. Ned. Ind. xii, 1856, p. 216. Koba, Banka, East Indies. New name for *Pomacentrus tæniops* Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 729. Koba. Not *P. tæniops* Cuv. & Val., 1830.

Range.—North Australia ; extralimital.

Genus BRACHYPOMACENTRUS Bleeker.

Brachypomacentrus Bleeker, Natuurk, Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 73. Haplotype, *Pomacentrus albifasciatus* Schlegel & Müller.

Brachypomacentrus albifasciatus (Schlegel & Müller).

Pomacentrus albifasciatus Schlegel & Müller, Verh. Nat. Ges. Ned. overz. bezitt. (Zool.), Pisees, 1844, p. 21. Celebes.

Range.—Queensland ; extralimital.

Genus EUPOMACENTRUS Bleeker.

Eupomacentrus Bleeker, Arch. Néerl. Sci. Nat. xii, 1877, p. 40 (*fide* Weber & Beaufort, Fish. Indo-Austr. Archip. i, 1911, p. 177) ; Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 73. Virtual haplotype, *Chætodon lividus* Bloch & Schneider.

Eupomacentrus nigricans (Lacépède) var. **subniger** (De Vis).

? *Holocentrus nigricans* Laeépède, Hist. Nat. Poiss. iv, 1802, pp. 332 & 367. *Ex* "*Aspro totus atratus*" &c. Commerson MS. No locality (probably Mauritius).

? *Pomacentrus scolopsecus* Quoy & Gaimard, Voy. Uranie Physic., Zool., Jan.-Mar. 1825, p. 398. Mauritius.

? *Pomacentrus tæniops* Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 423. Mauritius, &e. *Idem*, Lesson, Voy. Coquille ii, 1830, p. 190, pl. xxviii, fig. 2. Mauritius.

Pomacentrus subniger De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 873. Cardwell. Type in Queensland Museum.

Range.—Queensland ; North Australia ; extralimital (as *nigricans*).

Eupomacentrus lividus (Bloch & Schneider).

Chætodon lividus Bloch & Schneider, Syst. Ichth. 1801, p. 235. Pacific Ocean. *Ex* Forster MS., which was published later in Descr. Anim. maris Australis Terras (Lichtenstein ed.), 1844, p. 227. Near St. Christina I. or Waitaho.

Pomacentrus punctatus Quoy & Gaimard, Voy. Uranie Physic., Zool., 1824, pp. 395 & 398, pl. lxiv, fig. 1. Mauritius.

Pomacentrus prosopotænioides Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 286. Amboina.

Pomacentrus vitianus Sauvage, Bull. Soc. Philomat. Paris (7), iii, 1879, p. 206 (3 of reprint). Fiji.

Pomacentrus cyanospilos Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 709. Wahai, East Indies.

Range.—North Australia ; extralimital.

Eupomacentrus profundus (De Vis).

Pomacentrus profundus De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 873. Barrier Reef, Queensland.

Range.—Queensland.

NOTE.—I have failed to discover any specimen in the Queensland Museum which may be regarded as the type of this species with certainty.

Genus DAYA Bleeker.

Daya Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 71. Orthotype, *Pomacentrus jerdoni* Day.

Daya jerdoni (Day).

Pomacentrus jerdoni Day, Proc. Zool. Soc. Lond. 1873, p. 237. Madras, India.

Pomacentrus dolii Macleay, Proc. Linn. Soc. N. S. Wales vi, 1881, p. 65, pl. i, fig. 1. Port Jackson. Types in the Macleay Museum, University of Sydney.

Daya jerdoni var. *fusca* McCulloch, Mem. Qld. Mus. vii, 3, Nov. 4, 1921, p. 171, pl. ix, fig. 2. South Queensland.

Chromis virescens Ogilby, Mem. Qld. Mus. vii, 4, Dec. 19, 1922, p. 303, pl. xix, fig. 3. Hervey Bay. S. Queensland. Type in Queensland Museum.

Range.—New South Wales; Queensland; extralimital.

Genus PARAPOMACENTRUS Bleeker.

Parapomacentrus Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 65. Logotype, *Pomacentrus polynema* Bleeker, designated by Jordan, Gen. Fish. iii, 1919. p. 387.

NOTE.—Though Bleeker intimated that his *Pomacentrus polynema* was typical of this genus when he stated "Le type actuel est fort voisin du genre Pomacentrus," he did not make a formal type-designation.

Parapomacentrus bankieri (Richardson).

Glyphisodon bankieri Richardson, Rept. 15th Meet. Brit. Assn. Adv. Sci., 1845 (publ. late 1846), p. 253. Hong Kong.

Glyphisodon nemurus Bleeker, Nat. Tijdschr. Ned. Ind. xiii, 1857, p. 73. Kajeli and Amboina, East Indies.

Range.—Queensland; extralimital.

Subfamily GLYPHISODONTINÆ.

Genus GLYPHISODON Lacépède.

"*Abu-defduf*" Forskal, Descr. Anim. 1775, p. 59. Vernacular. Haplotype, "*Chætodon sordidus*" Forskal. This work is non-binomial.

Glyphisodon Lacépède, Hist. Nat. Poiss. iv, 1802, p. 542. Logotype, *Glyphisodon moucharra* Lacépède = *Chætodon saxatilis* Linnæus, selected by Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 91.

Gliphysodon Duméril, Zool. Analyt. 1806, p. 336, vernac. on p. 134. *Genus cœlebs.* Logotype *Chætodon saxatilis* Linnæus, designated by Froriep, Analyt. Zool. (Duméril, German ed.), 1806, p. 135 as *Glyphisodon*, and p. 336 as *Gliphysodon*.

Glyphidodon Agassiz, Nomencl. Zool. 1846, Index Univers. Emendation for *Glyphisodon* Lacépède.

Glyphisodon cœlestinus Cuv. & Val.

Glyphisodon cœlestinus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 464, pl. cxxxv. Mauritius. Namo *ex Chætodon cœlestinus* Solander MS. (Ulietea, Society Islands.)

Range.—Queensland ; North Australia ; extralimital.

Note.—Cuvier & Valenciennes' account indicates that Mauritius is the type-locality of this species, which is evidently distinct from *G. sexfasciatus* (Lacépède).

Glyphisodon palmeri Ogilby.

Glyphisodon palmeri Ogilby, Mem. Qld. Mus. ii, Dec. 10, 1913, p. 87, pl. xxii, fig. 2. Moreton Bay, Queensland. Types in Queensland Museum.

Range.—Queensland.

Glyphisodon sexfasciatus (Lacépède).

Labrus sexfasciatus Lacépède, Hist. Nat. Poiss. iii, 1802, pp. 430 & 477, pl. xix, fig. 2. "Le grand golfe de l'Inde."

A specimen in the Queensland Museum (No. *I. 2551*) from Cape York. New record for Australia.

Range.—Queensland ; extralimital.

Glyphisodon saxatilis (Linnæus).

"*Sparus fasciis quinque transversis, subfuscis*" Balk, Mus. Adolpho-Fridericianum (Linnæus), May 1746, p. 34. Pre-Linnean polynomial.

Chætodon saxatilis Linnæus, Syst. Nat., ed. 10, 1758, p. 276 ; ed. 12, 1766, p. 466. Based on Mus. Ad. Fr. i, p. 64 ; Amœn. Acad. i, p. 312 ; & Gronow, Mus. 1, No. 89. "India."

Glyphisodon vaigiensis Quoy & Gaimard, Voy. Uranie Physic., Zool., Jan.-March 1825, p. 391. "Îles des Papous" = Waigiou.

Glyphisodon waigiensis Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 457. Waigiou.

Range.—New South Wales ; Queensland ; extralimital.

Glyphisodon septemfasciatus Cuv. & Val.

Glyphisodon septemfasciatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 463. Mauritius.

Range.—Queensland ; North-western Australia ; extralimital.

Glyphisodon sordidus (Bonnaterre).

"*Chætodon sordidus*" Forskal, Descr. Anim. 1775, p. 62. Red Sea. Non-binomial work.

Chetodon [sic] *sordidus* Bonnaterre, Tabl. Encycl. Meth. Ichth., 1788, p. 90. *Ex* Forskal. Red Sea.

Range.—Queensland ; extralimital.

Glyphisodon expansus De Vis.

Glyphidodon expansus De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 875. Barrier Reef, Queensland.

Range.—Queensland.

Note.—The type of this species appears to have been lost, as I was unable to find it when examining the Queensland Museum collection.

Glyphisodon luteocaudatus Saville-Kent.

Glyphidodon luteo-caudata Saville-Kent, Great Barrier Reef of Australia, 1893, p. 308, chromo-pl. xvi, fig. 11. Queensland.

Range.—Queensland.

NOTE.—Not recognised since first named.

Genus AMBLYGLYPHIDODON Bleeker.

Amblyglyphidodon Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 92. Orthotype, *Glyphisodon aureus* Cuv. & Val.

Amblyglyphidodon curacao (Bloch).

Chætodon curacao Bloch, Nat. Ausl. Fische iii, 1787, p. 106, pl. ccxii, fig. 1. "Curaçao"=East Indies.

Mr. E. H. Rainford has collected this species for the Australian Museum at Port Denison and Hook Island, Whitsunday Passage, Queensland. New record for Australia. He noted the colours as "Back dark green. Belly silvery. Iris yellow, smudged with black. Dorsal, anal, and caudal whitish."

Range.—Queensland; extralimital.

Genus NEGOSTEGASTES Whitley.

Negostegastes Whitley, *gen. nov., supra*, pp. 210 & 225. Orthotype, *Glyphisodon leucozona* Bleeker.

Negostegastes leucozona (Bleeker).

Glyphisodon leucozona Bleeker, Nat. Tijdschr. Ned. Ind. xix, 1859, p. 338. Karangbollong, Java.

Range.—New South Wales; extralimital.

NOTE.—Only known from Australian waters from a small specimen in the Australian Museum. It agrees fairly well with Bleeker's figure (Atl. Ichth. ix, 1877, pl. ccccvii, fig. 2), but further specimens are desirable before the identification can be regarded as satisfactory.

Genus PARAGLYPHIDODON Bleeker.

Paraglyphidodon Bleeker, Versl. Akad. Amsterdam xii, 1876, p. 38. Type, *P. oxycephalus* Bleeker (*fide* Jordan, Gen. Fish. iii, 1919, p. 384). Paper not seen by me.

Paraglyphidodon Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 116. Logotype, *P. oxycephalus* Bleeker, designated by Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 122.

Paraglyphidodon melas (Cuv. & Val.).

Glyphisodon melas Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 472. *Ex* Kuhl & van Hasselt MS. Java.

Glyphisodon ater Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 473. *Ex* Ehrenberg MS. Massowah, Red Sea.

Range.—Queensland; extralimital.

Paraglyphidodon melanopus (Bleeker).

Glyphisodon melanopus Bleeker, Nat. Tijdschr. Ned. Ind. xi, 1856, p. 82. Ora Malang, South-east Java.

Range.—Queensland; extralimital.

Genus GLYPHIDODONTOPS Bleeker.

Glyphidodontops Bleeker, Arch. Néerl. Sci. Nat. xii, 1877, p. 41. Orthotype, *Glyphisodon antjerius* Cuv. & Val. (*fide* Jordan, Gen. Fish. iii, 1919, p. 387).

Glyphidodontops amabilis (De Vis).

Glyphidodon amabilis De Vis, Proc. Linn. Soc. N. S. Wales viii. 4, Feb. 21, 1884, p. 452. South Sea Islands.

Range.—Queensland ; extralimital.

Glyphidodontops unimaculatus (Cuv. & Val.).

Glyphisodon unimaculatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 478. Timor.

Range.—Queensland ; extralimital.

Glyphidodontops zonatus (Cuv. & Val.).

Glyphisodon zonatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 483. New Guinea.

Glyphisodon rossii Bleeker, Nat. Tijdschr. Ned. Ind. vii, 1854, p. 48. Nova Selma, Kokos Is., East Indies.

Glyphodon albocinctus Kner, Sitzb. Akad. Wiss. Wien lvi, 1867, pl. iv, fig. 2. No locality (*fide* Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 179).

Glyphisodon cingulatus Kner, Sitzb. Akad. Wiss. Wien lvi, 1867, p. 725. Samoa (*fide* Fowler & Bean, loc. cit.).

Range.—Queensland ; extralimital.

Genus IREDALEICHTHYS Whitley.

Iredaleichthys Whitley, Rec. Austr. Mus. xvi, 6, June 11, 1928, p. 296. New name for *Chrysiptera* Swainson, preocc. Orthotype, *C. azurea* Swainson = *Glyphisodon cyaneus* Quoy & Gaimard.

NOTE.—This genus is discussed in detail in this paper, *supra*, p. 226.

Iredaleichthys hedleyi (Whitley).

Glyphisodon hedleyi Whitley, Rec. Austr. Mus. xvi, 1, Oct. 7, 1927, p. 20, pl. i, fig. 5. Port Moresby, Papua. Holotype in Austr. Mus., Sydney.

Range.—Queensland and New Guinea.

Iredaleichthys modestus (Schlegel & Müller).

Glyphisodon modestus Schlegel & Müller, Verh. Nat. Ges. Ned. overz. bezitt. Zool. (Pisc.) 1844. p. 23, pl. vi, fig. 2. Java.

Glijphisodon phaiosoma Bleeker, Verh. Bat. Genootsch. xxii, 1849, p. 9. Bali.

Range.—Queensland ; extralimital.

NOTE.—This species is regarded as a synonym of *Glyphisodon glaucus* Cuv. & Val. (Hist. Nat. Poiss. v, July 1830, p. 475, Guam) by Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 169.

Iredaleichthys uniocellatus (Quoy & Gaimard).

Glyphisodon uniocellatus Quoy & Gaimard, Voy. Uranie Physic., Zool., Jan.-March 1825, p. 393, pl. lxiv, fig. 4. Coupang, Timor and Marianne Is.

Chrysiptera gamardii Swainson, Nat. Hist. Classif. Fish. Amphib. Rept. ii, July 1839, p. 216. Based on Quoy & Gaimard's figure of *G. uniocellatus*.

Range.—New South Wales ; Queensland ; extralimital.

Subfamily PARMINÆ.

Genus ACTINOCHROMIS Bleeker.

Acanthochromis Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, p. 6. Orthotype, *Heliastes lividus* Steindachner (*i.e.* Klunzinger) = *Glyphidodon victoriæ* Günther. Error for *Actinochromis* Bleeker; not *Acanthochromis* Gill 1863.

Actinochromis Bleeker, Natuurk. Verh. Holl. Maatsch. Wetensch. (3) ii, 6, 1877, pp. 39, 142, & 166. Emendation for *Acanthochromis* Bleeker (*non* Gill).

NOTE.—For discussion on this genus, *vide supra*, p. 232.

Actinochromis victoriæ (Günther).

Glyphidodon victoriæ Günther, Ann. Mag. Nat. Hist. (3) xi, Feb. 1, 1863, p. 115. Victoria. Type in British Museum.

Heliastes lividus Klunzinger, Arch. Naturg. (Wiegmann), xxxviii, 1, 1872, p. 36. Port Phillip, Victoria.

Range.—Victoria, South Australia; Tasmania; West Australia ?

Genus PARMA Günther.

Parma Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 57. Logotype, *P. microlepis* Günther, designated by Jordan, Gen. Fish. iii, 1919, p. 318.

Parma microlepis Günther.

Parma microlepis Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 57. Port Jackson. Type in British Museum.

Parma squammipinnis Günther, Cat. Fish. Brit. Mus. iv, 1862, pp. 58 & 505. "Australia" and Port Jackson. Type in British Museum.

Glyphidodon (*Parma*) *australis* Steindachner, Sitzb. Akad. Wiss. Wien lvi, 1, 1867, p. 328. No locality = Port Jackson.

Range.—Victoria; New South Wales; South Australia.

Parma unifasciatus (Steindachner).

Pomacentrus unifasciatus Steindachner, Sitzb. Akad. Wiss. Wien lvi, 1, 1867, p. 326. No locality = New South Wales. Preoccupies *P. unifasciatus* Kner 1868 from Fiji, which is a synonym of *Pellochromis xanthosoma* (Bleeker).

Range.—New South Wales.

Parma oligolepis Whitley.

Parma oligolepis Whitley, *sp. nov.*, *supra*, p. 230.

Range.—Queensland.

Parma viola Whitley.

Parma viola Whitley, *sp. nov.*, *supra*, p. 231.

Range.—Tasmania.

Parma mccullochi Whitley.

Parma mccullochi Whitley, *sp. nov.*, *supra*, p. 228.

Range.—West Australia.

Family CHROMIDÆ.

Genus MECÆNICHTHYS Whitley.

Mecœnichthys Whitley, *gen. nov.*, *supra*, p. 218. Orthotype, *Heliastes immaculatus* Ogilby.

Mecœnichthys immaculatus (Ogilby).

Heliastes immaculatus Ogilby, Proc. Linn. Soc. N. S. Wales x, 3, "1886" = Dec. 21, 1885, p. 446. Shark Reef, Port Jackson. Type in Austr. Mus., Sydney.

Range.—New South Wales; Southern Queensland.

Genus CHROMIS Cuvier.

Chromis Cuvier, Bull. Soc. Sci. Philom. Paris, Oct. 1814, p. 88 (*fide* Sherborn, Index Animalium). Not *Chromis* Plumier 1803, non-binomial (*fide* Sherborn) and not *Cromis* Browne 1789, non-binom. Preoccupies *Chromis* Hübner 1820, a genus of insects, and *Chromis* Gray, Cat. Fish. coll. Gronow Brit. Mus., 1854, p. 149, a genus of Pomatomid fishes. Type by tautonomy *Sparus chromis* Linnæus.

"*Les Heliases*" Cuvier, Règn. Anim. ed. 2, ii, April 1829, p. 180. Vernacular.

Heliases Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 494. Logotype, *H. insolatus*, figd. on pl. cxxxvii; designated by Valenciennes, Dict. Univ. d'Hist. Nat. vi, 1845 (reissue, 1861), p. 503. - *Idem*, Voigt, Das Thierreich (Cuvier) ii, 1832, p. 247.

Heliasus Griffith, Anim. Kingd. (Cuvier), x, 1834, p. 161. *Ex* Cuvier, *vernac.*

Heliastes Lowe, Trans. Zool. Soc. Lond., June 1839, p. 177, and Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 60. *Emend. pro. Heliases* Cuv. & Val.

Heliazes Valenciennes in Webb & Berthelot Hist. Nat. Îles Canaries (Ichth.), 1843, p. 27 (*fide* Sherborn, Index Animalium).

NOTE.—I regard as probably distinct from *Chromis*, the following nominal genera:—*Hoplochromis* Fowler, *Ayresia* Cooper, *Furcaria* Poey = *Demoiselle* Whitley, and *Onychognathus* Troschel = *Agripopa* Whitley. For references to literature on these, see Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 30, and Whitley, Rec. Austr. Mus. xvi, 6, 1928, pp. 295-297.

Chromis nitidus (Whitley).

Tetradrachmum nitidum Whitley, Rec. Austr. Mus. xvi, 4, March 28, 1928, p. 219, pl. xvii, fig. 3. Hayman I., Queensland. Type in Austr. Mus., Sydney.

Range.—Queensland.

NOTE.—One from Hervey Bay in the Queensland Museum; Regd. No. *I. 3481.*

Chromis hypsilepis (Günther).

Heliastes hypsilepis Günther, Ann. Mag. Nat. Hist. (3) xx, July 1, 1867, p. 66. New South Wales. Type in British Museum.

Range.—New South Wales.

NOTE.—Allied to *Chromis dispilus* Griffin (Trans. N. Z. Inst., liv, Dec. 14, 1923, p. 254, pl. xxv), in which the males are said to be less deep-bodied than the females.

Chromis klunzingeri sp. nov.

Heliastes hypsilepis Klunzinger, Sitzb. Akad. Wiss. Wien lxxx, 1, 1879, p. 398. Not *H. hypsilepis* Günther 1867. King George's Sound, W. Australia.

Range.—West Australia.

Chromis scotochilopterus Fowler.

Chromis scotochilopterus Fowler, Proc. Acad. Nat. Sci. Philad. lxx, 1, 1918, p. 61, fig. 24. Philippine Is. Spelt *C. xotochilopterus* in Zool. Rec.

Range.—Queensland ; extralimital.

Genus HOPLOCHROMIS Fowler.

Hoplochromis Fowler, Proc. Acad. Nat. Sci. Philad. lxx, 1, 1918, p. 66. Orthotype, *Heliases cæruleus* Cuv. & Val.

Hoplochromis cæruleus (Cuv. & Val.).

Heliases cæruleus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 497. New Guinea & Ulea.

Heliases lepisurus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 498. New Guinea.

Heliases frenatus Cuv. & Val., Hist. Nat. Poiss. v, July 1830, p. 498. Guam.

Heliastes lepidurus Günther, Cat. Fish. Brit. Mus. iv, 1862, p. 63. Emendation.

Glyphisodon bandanensis Bleeker, Nat. Tijdschr. Ned. Ind. ii, 1851, p. 248. Neira, Banda.

Range.—Queensland ; extralimital.

Genus TETRADRACHMUM Cantor.

Dascyllus Cuvier, Règn. Anim. ed. 2, ii, April 1829, p. 179. Haplotype, *Chætodon aruanus* Linnæus. Preoccupied by *Dascillus* Latreille, 1796, and Berthold, 1827, a genus of Coleoptera, emended to *Dascylus* by Agassiz 1846 (*vide* Sherborn, Index Animalium). *Idem*, Gerbe. Dict. univ. d'Hist. Nat. iv, 1844 (reissue, 1861), p. 608 : " Cuvier aurait dû écrire *Dascille*."

Pirene Gistel, Naturg. d. Thierr. hohere Schulen, 1848, p. ix. New name for *Dascyllus* Cuv. & Val., 1830 (= Cuvier 1829), preocc., but itself preoccupied by *Pyrene* Bolten, Mus. Bolten. (2), 1798, p. 134, a genus of molluscs. Type, *Chætodon aruanus* Linn.

Tetradrachmum Cantor, Journ. Roy. Asiat. Soc. Bengal xviii, 2, 1849, p. 1222 ; Cat. Malay. Fish. 1850, p. 240. Substitute for *Dascyllus* Cuv., preocc. Virtual haplotype, *Chætodon aruanus* Linnæus.

Dascillus Gray, Cat. Fish. coll. Gronow Brit. Mus., 1854, p. 171, spelt *Dascellus* in index, p. 196. Species not named *Chætodon aruanus* Linnæus, haplotype. *Dascilus* Gray, a slightly earlier variant, was given by Fowler & Bean (Bull. U. S. Nat. Mus. 100, vii, 1928, p. 13) but I have not been able to confirm this.

Tetradrachmum aruanum (Linnæus).

Chætodon aruanus Linnæus, Syst. Nat., ed. 10, 1758, p. 275 ; ed. 12, 1766, p. 464. Based on " Mus. Ad. Fr. i, p. 63, t. 33, f. 8," which I have not seen. " Habitat in Indiis" [= Aru Islands]. Not in Balk, Museum Adolpho-Friderieianum, 1746.

Chætodon arcuanus Gmelin, Syst. Nat. (Linnæus), ed. 13, i, 3 (before Nov. 20) 1789, p. 1250. Revival of a name used by Linnæus before 1758.

" *Pimeleptère ? simunad* " Thiollière, Ichth. in Montrouzier, Ann. Soc. Imp. d'Agric., Lyons, viii, 1856 (Faune Île Woodlark, 1857), p. 199. *Ex* Montrouzier MS., vernacular. Woodlark Island.

Dascyllus blochii Castelnau, Viet. Offic. Rec. Philad. Exhib. (Res. Fish. Austr.), 1875, p. 34. Queensland.

Range.—Queensland ; extralimital.

NOTE.—Fowler (Proc. Acad. Nat. Sci. Philad. 1907 (1908), p. 433) has wrongly recorded this species from Victoria but his specimen came from Fiji.

Genus PELLOCHROMIS Fowler & Bean.

Pellochromis Fowler & Bean, Bull. U. S. Nat. Mus. 100, vii, 1928, p. 13. Orthotype, *Pomacentrus trimaculatus* Rüppell.

Pellochromis xanthosoma (Bleeker).

Dascyllus xanthosoma Bleeker, Nat. Tijdschr. Ned. Ind. ii, 1851, p. 247. Banda.

Range.—Queensland ; extralimital.

Pellochromis trimaculatus (Rüppell).

Pomacentrus trimaculatus Rüppell, Atlas zu Rüppell, Reise (Senckenb. Nat. Ges.), Fische, 1829, p. 39, pl. viii, fig. 3. Massowah, Red Sea.

Range.—Queensland ; extralimital.

Genus ACANTHOCHROMIS Gill.

Acanthochromis Gill, Proc. Acad. Nat. Sci. Philad. xv, 1863, p. 214. Orthotype, *Dascyllus polyacanthus* Bleeker.

Heptadecanthus Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales i, 4, March 1877, p. 343. Haplotype, *H. longicaudis* Alleyne & Macleay. Mis-spelt *Heptadecacanthus* in the Zool. Rec., and by authors.

Acanthochromis longicaudis (Alleyne & Macleay).

Heptadecanthus longicaudis Alleyne & Macleay, Proc. Linn. Soc. N. S. Wales, i, 4, March 1877, p. 343, pl. xv, fig. 3. Cape Grenville.

Range.—Queensland.

Acanthochromis maculosus (De Vis).

Heptadecanthus maculosus De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 873. Cardwell. Type in Queensland Museum.

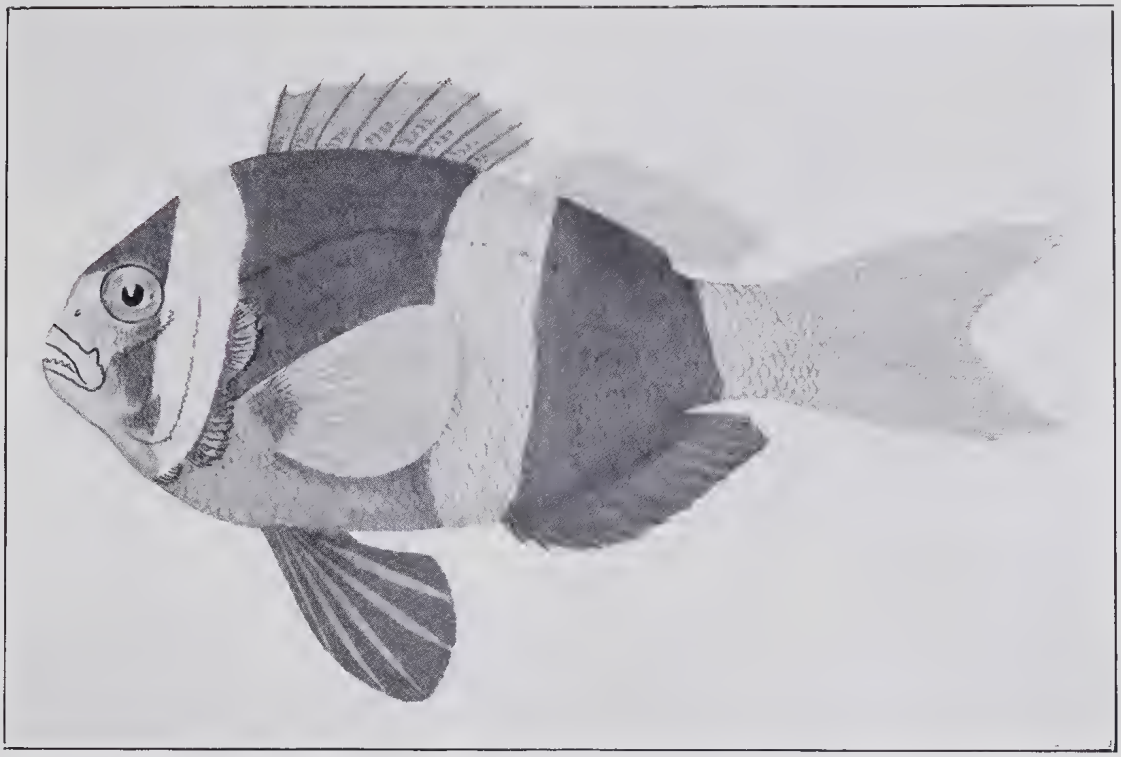
Range.—Queensland.

Acanthochromis brevipinnis (De Vis).

Heptadecanthus brevipinnis De Vis, Proc. Linn. Soc. N. S. Wales ix, 4, March 4, 1885, p. 872. Queensland coast. Type in Queensland Museum.

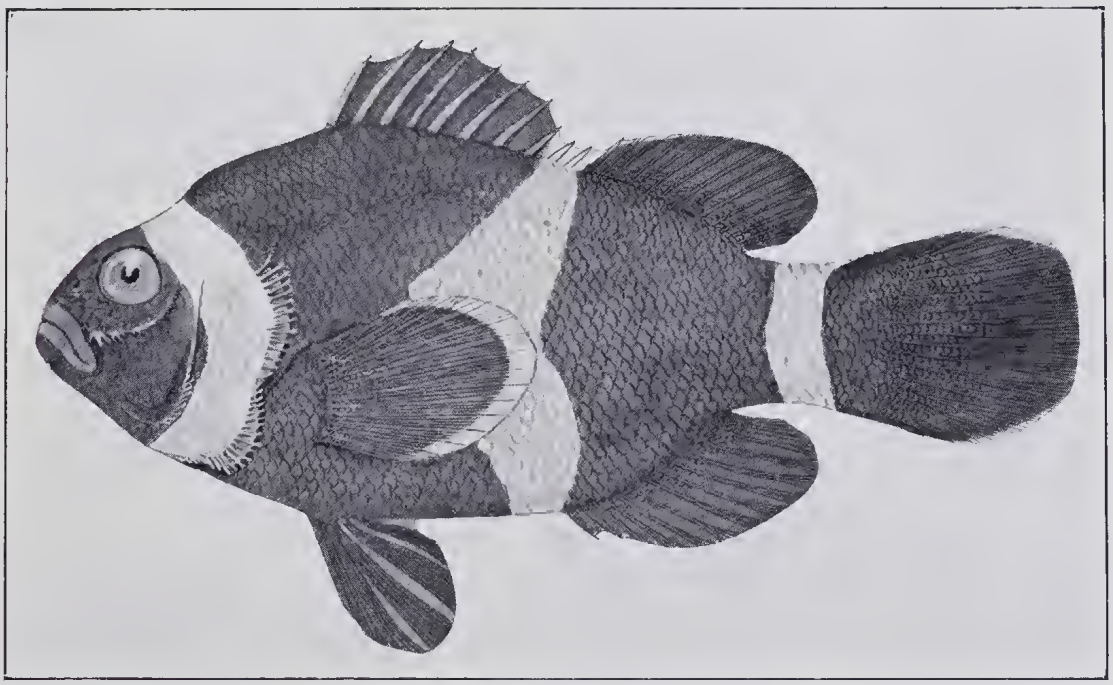
Range.—Queensland.

The following new names have been proposed in this paper :—Generic : *Mecœnichthys*, *Negostegastes*, and *Phalerebus*. Specific : *Amphiprion mccullochi*, *Chromis klunzingeri*, *Eupomacentrus paschalis*, *Parma mccullochi*, *Parma oligolepis*, and *Parma viola*.



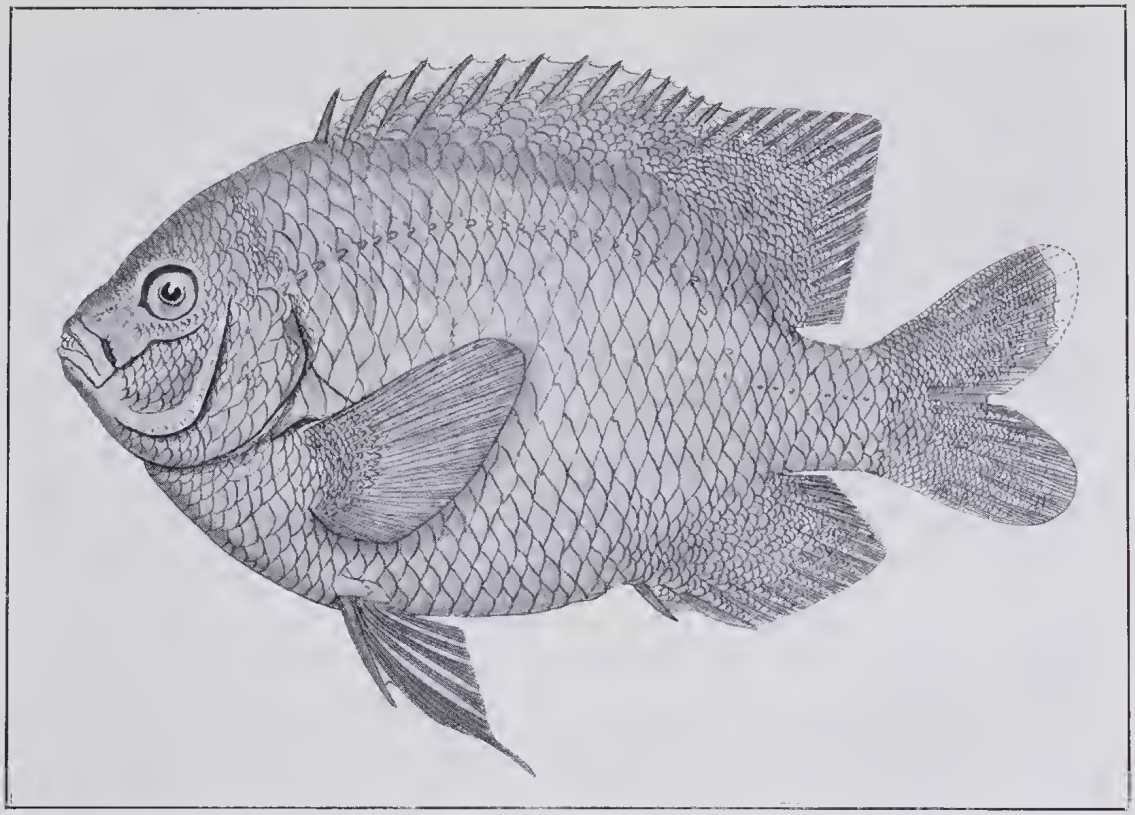
G. P. Whitley, del.

Fig. 1.—Amphiprion papuensis Macleay.
D'Entrecasteaux Is. Holotype. *Austr. Mus. No. I. 9240.*



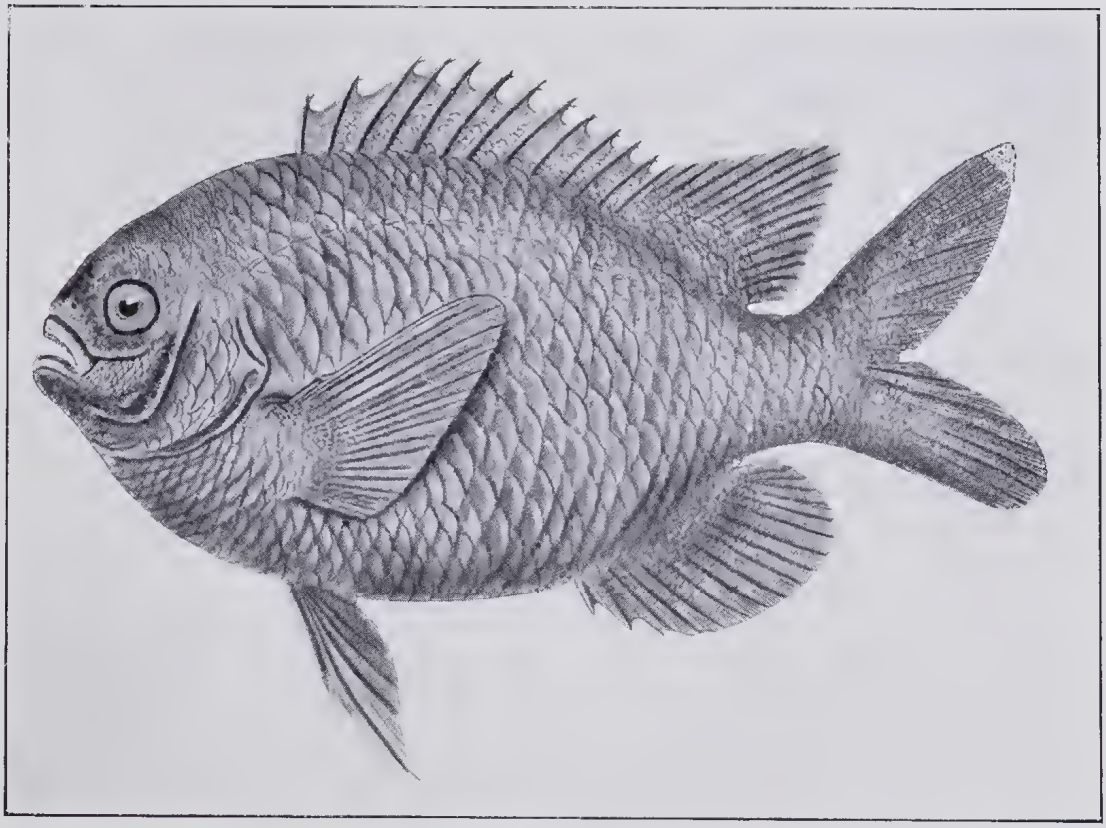
G. P. Whitley, del.

Fig. 2.—Actinicola bicolor (Castelnau).
Port Darwin. *Austr. Mus. No. A. 4834.*



G. P. Whitley, del.

Fig. 1.—Parma oligolepis Whitley.
Holotype; Qld. Mus. No. *I.3536.* Cape Moreton, Q.



Joyce K. Allan, del.

Fig. 2.—Parma viola Whitley.
Holotype: Austr. Mus. No. *I.6611.* Tasmania.

PALÆONTOLOGICAL NOTES.

By Heber A. Longman, F.L.S., C.M.Z.S. (Director).

(Plate XXIX.)

SPECIMENS FROM A WELL AT BRIGALOW.

In March, 1929, an interesting collection of fossil fragments was received from Brigalow, Darling Downs, Queensland, through the kindness of Messrs. Zeller Brothers. The specimens were obtained during the sinking of a well on their property at Brigalow. Several beds of sand were found from "16 feet down to 100 feet," and each bed yielded fossil bones.

The fragments from this well represent at least seven different vertebrates. Perhaps the most significant of these are fragments making about half of a cranium of the extraordinary marsupial for which the writer erected the genus *Euryzygoma* in 1921.[1] The fossils sent by Messrs. Zeller Brothers may be recorded as follows :—

Euryzygoma dunense.

Compared with the original Brigalow cranium previously described (*loc. cit.*), this is a far younger animal. Although the zygomatic arches are distorted and incomplete, the distinctive features of the genus are well marked. In this marsupial the inferior lateral processes of the anterior part of the zygomata reach a development which is without a parallel among other mammals, and this is accompanied by a distinctive structure of the zygomatic processes of the maxillæ. The architecture of these accessory processes was described in detail in the original paper, and in this region the differences between *Euryzygoma* and the species of *Nototherium* are obvious at a glance when direct comparison is made.

In view of these and other distinctive features that were set forth in the detailed description of the first Brigalow skull, it is somewhat surprising that a writer in "Nature" (May 19th, 1921, p. 372) should question the generic separation of this marsupial from *Nototherium mitchelli* and *N. tasmanicum*. Obviously *Euryzygoma* is an extremely specialised member of the *Nototherium* group and is an example of the evolution of a bizarre type. Probably the remarkable development of the zygomatic processes reached its maximum in adult males, but the total material received shows that these special features were present in younger forms. On these structures alone generic status would be justified. A specimen consisting of a right maxilla with three molars, found at Ehlma Siding, near Brigalow, and forwarded by Mr. Thomas Jack in October, 1923, also exhibits the distinctive features of *Euryzygoma*. This specimen (F. 1520), which is highly polished, was found "in quick-sand."

A comparison may appropriately be made between the extreme lateral development of the arches in *Euryzygoma* with the dependent processes in certain Entelodonts described by E. L. Troxell,[2] of which *Megachœrus zygomaticus* is a remarkable example.

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[1] 1921, Longman, Mem. Qld. Mus., vol. vii, pp. 65-80.

[2] 1920, E. L. Troxell, Amer. Journ. Sci., vol. l, p. 433.

In view of the present writer's suggestion (1921, p. 73) that the extraordinary lateral extensions in *Euryzygoma* supported "cheek pouches," it is of interest to note that Troxell, following Lull's remarks regarding similar structures in the Ceratopsia, notes the possibility of "cheek pouches" as an explanation of the dependent processes in Entelodonts (*loc. cit.*, p. 255).

The full molar series is present in the cranial remains sent by Messrs. Zeller Brothers, but one of the subtriangular premolars is incomplete. A tract of dentine is exposed on the hind lobe of the last molar, but the state of wear on the series is very much less than in the first-described cranium. The premaxillæ are missing, and the fragments of the occipital and parietal regions are so badly crushed that they do not lend themselves to useful reconstruction.

Diprotodon australis.

Dorsal vertebra. This specimen was in four pieces, but now forms a fairly complete vertebra representing a Diprotodon fully as large as the well-known cast of this marsupial supplied by the Museum of South Australia, Adelaide. Incidentally it may be mentioned that we have individual bones which far surpass the dimensions of this cast, and one of them, presented by Mr. Thomas Jack, of Dalby, was recorded by the writer in 1924.[3] This vertebra from Brigalow is thinly covered with a deposit of calcareous earth, which is very characteristic of some specimens found near the Condamine River on or near the surface.

Macropus anak.

Incomplete left incisor of an aged individual. This specimen has the bluish tint, corresponding to Ridgway's "cinerens," which is frequently seen in the enamel of fossil macropodes from the Darling Downs. The facet of wear on the inner surface, caused by the movement of the two rami and made possible by the non-rigidity of the symphysis, is well marked on this incisor. The significance of this feature in present-day marsupials has been interestingly dealt with by C. Anderson.[4]

Fragments representing an almost complete humerus and a femur are tentatively placed with this species, whilst a portion of a pelvic girdle with a perfect acetabulum represents either a younger individual or one of the smaller species.

Chelonian fragments.

Three small pieces of a carapace (F. 2119) are evidently conspecific with the type material of the extinct Chelonian described by the late C. W. De Vis as *Chelymys uberrima*,[5] but which should be more correctly known as *Emydura uberrima*. The largest shard is about 50 mm. by 40 mm. These small fragments show that the sulci or grooves between the horny shields on the carapace are deep and well defined, very much more so than in *Emydura macquarrii* and even more than in some species of *Chelodina*. In this respect they resemble the latter genus. There are no prominent rugosities on the shards, but vermicular impressions are noticeable.

Another specimen from Brigalow (F. 2119) is a fairly complete right ilium of a Chelonian, which is much more robust in the shaft than the ilium in an exceptionally large specimen of *Chelodina expansa*, the carapace of which is 380 mm. in length.

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[3] 1924, Longman, Mem. Qld. Mus., viii, p. 17.

[4] 1927, C. Anderson, Austr. Zoologist, v, pp. 105-112.

[5] 1897, De Vis, Ann. Qld. Mus., No. 3, p. 3.

A still larger specimen of an ilium in the Museum collection, for which we have no precise locality, shows that the freshwater Chelonians of the past were giants compared with those of to-day.

Some half-a-dozen very fragmentary shards from Messrs. Zeller Brothers' series cannot be satisfactorily identified.

F. Chapman has referred a fossil east of a tortoise found in a bed of ironstone at Carapook, Victoria,[6] to the genus *Emydura*, and Lydekker has recorded both *Emydura* and *Chelodina* from Australia.[7]

Pallimnarchus pollens De Vis.

This extinct crocodile is represented by an incomplete tooth and two fragments of scutes (F. 2118).

Fish Remains.

These consist of two anterior dorsal spines. One of these (F. 2120) has a serrated anterior edge and appears to be allied to the common "freshwater catfish" or "dewfish," *Tandanus tandanus*. In the Museum collection there are two other spines from Chinchilla (F. 16-1180) which have been registered as *Tandanus* sp., but which are considerably larger than the spines of the present-day species.

The other dorsal spine from Brigalow has been tentatively recorded as *Oligorus* sp. (F. 2122). In our old collections we have several fossil specimens from the Darling Downs which represent a fish allied to or identical with the Murray Cod of to-day, *Oligorus macquariensis*.

RHŒTOSAURUS BROWNEI.

(Plate XXIX.)

Opportunity is taken to illustrate the remains of the Queensland Jurassic Dinosaur *Rhœtosaurus brownei* as now on exhibition in this Museum (Plate XXIX, figures 1 and 2). A large painting in oils, showing the probable appearance in life of these giant herbivorous Dinosaurs and the characteristic vegetation of the period, has been placed above the fossils. Owing to the incompleteness of our material this has been largely based on the reconstructions of *Camarasaurus*, an allied American form, by E. S. Christman in the American Museum of Natural History. The artist, Mr. Douglas S. Annand, has put some excellent work into our painting. His Excellency Sir John Goodwin has also given assistance by providing a striking little sketch showing the relative proportions of a modern horse and the giant Dinosaur.

In addition to the detailed description of this fossil in our Memoirs,[8] a popular account of *Rhœtosaurus brownei* was published in "The Australian Museum Magazine," vol. iii, July-September, 1927. In this article a photograph by Mr. L. C. Ball,

[6] 1919. F. Chapman, Proc. Roy. Soc. Vict., 32 (n.s.), p. 12.

[7] 1889, R. Lydekker, Cat. Foss. Rept. Brit. Mus., iii, p. 168.

[8] 1926, Longman, Mem. Qld. Mus., viii., pt. 3, pp. 183-194; and 1927, Longman, Mem. Qld. Mus., ix, pt. 1, pp. 1-18, plates i-v.

Deputy Chief Government Geologist, showing the site of the discovery on Durham Downs, was reproduced. It is hoped that additional remains will be forthcoming from this locality later.

NEW RECORDS.

Among our records of Queensland vertebrate fossils from new localities are the following :—

Diprotodon australis Owen.

Mandibular fragment with one incomplete molar from the Flinders River, Maxwelton, W.Q. Presented by Mr. Rex W. Crane (F. 1791). The Flinders River region has yielded a rich store of marine Cretaceous fossils, but this specimen, which was picked up in the bed of the river at Maxwelton, must have come from recent deposits.

Diprotodon australis.

Mandibular fragment with remains of two molars from Bluff Downs, Mr. Ernest White's station, north-west of Charters Towers. Presented by Mr. C. M. Rogers (F. 1907). The head of a left humerus was also received. Mr. Michael Rogers, who forwarded these fossils, says that they were found " under the basalt outcrop of that country."

Diprotodon australis.

Maxillary fragment with two molars (F. 2019). Picked up by aboriginal stockman at the junction of the Dart and Broken Rivers, Urana Run, Collinvale, Bowen, N.Q. Presented by Mr. A. Garbutt, and received through Mr. J. A. Rheuben and the Department of Agriculture and Stock, Brisbane. The two molars, which are well preserved, represent an aged individual.

Diprotodon minor Huxley.

Mandibular fragment with symphysis and two incomplete incisors (F. 1822). Presented by the Rev. C. H. Massey. This was obtained near Murgon, S.E. Q., but was handed to donor without precise locality. The writer has shown that there are distinctive features in the symphyseal region between *Diprotodon australis* and *D. minor.*[9]

Nototherium sp.

Mandibular fragment with two molars (F. 2049). Near Logan Downs Station, Clermont, Q. Presented by Mr. Gordon A. Fairbairn. This fragment, which is much abraded, was " picked up on surface under Telegraph Line, about five miles from Logan Downs Station towards Grosvenor Downs."

Palorchestes sp.

Fragments of two molars (F. 1761), which are mainly alveolar, found at a depth of 40 feet in a well at Castle Creek, Rannes, S.E. Q. These were found by Mr. R. S. Philp and received through Professor H. C. Richards. These fragments may represent a new species, but the material is inadequate for precise determination.

[9] 1926, Longman, Mem. Qld. Mus., vol. viii, p. 18.

Painting placed above the remains of *Rhætosaurus brownei*, partly based on E. S. Christman's models of *Camarasaurus*, an allied American Dinosaur.

Artist: Douglas S. Annand.

Remains of *Rhætosaurus brownei*, the Queensland Dinosaur, mounted on stand 25 feet in length in the Queensland Museum.

Face page 250.

Macropus cf. **anak.**

Mandibular fragment with three molars (F. 2096). Found whilst sinking a well, "40 feet below the surface," at Knapp's Creek, near Beaudesert, S.E. Q. Presented by Mr. D. Salisbury, and received through Mr. L. Power.

This specimen represents one of the larger extinct species of *Macropus*, and as these are somewhat difficult to determine on incomplete series of molars it may be *M. ræchus*. Pending a revision of our fossil Macropodidæ, it may here be noted that some specimens in the Queensland Museum recorded as *M. anak* should probably be placed with allied species. The writer considers that the forms with the very elongated lower premolar described by Owen as *Protemnodon ræchus* are specifically distinct from *anak*, and that both species are generically separable from *Macropus*. In these large specimens the lower premolar may attain an antero-posterior length of 19·5 mm., and one is even reminded of the carnassial of *Thylacoleo*. Although there is considerable variability in the size of the premolars in our specimens, the writer cannot agree with De Vis in "lumping" all of these under *Macropus anak*.[10]

In December, 1926, some fragments of bones found at a depth of about 30 feet when sinking a well in the bed of Nogo Creek, near Rawbelle, Burnett district, S.E. Q., were received from Mr. E. J. Shaw, through Dr. Guilford Davidson. These included a scute (in four pieces) and a tooth of an extinct crocodile, *Pallimnarchus pollens*. Other fragments, which could not be specifically determined, represent a species of *Macropus*.

Dromaius novæ-hollandiæ.

The proximal end of a tibio-tarsus of an emu, closely comparable with that of the present-day species but fossilized, was found in the bed of the Condamine, near Dalby, with the remains of extinct marsupials by the writer in company with Mr. Thomas Jack (F. 1652).

Some of the above specimens have been recorded as exhibits in the Proceedings of the Royal Society of Queensland. It is of interest to note that until the last few years practically all of the fossil marsupials found in Queensland came from the Darling Downs, chiefly from the Condamine River and its tributaries. It is evident, however, that we may expect many finds of extinct forms from recent deposits in other parts of Queensland. W. H. Bryan has suggested that the name "Diprotodon Beds" should be given "for the older alluvial deposits containing fossil remains of giant and other marsupials of Pleistocene age."[11] The present writer anticipates that marsupial fossils of undoubted Tertiary age will later be found in Queensland, and in this connection it is of interest to refer to the discoveries of Tertiary sediments tabulated in 1926 by O. A. Jones.[12]

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[10] 1894, De Vis, Review Fossil Macropodidæ, Pr. Linn. Soc. N.S.W., x, p. 104.

[11] 1928, W. H. Bryan, "A Glossary of Qld. Stratigraphy," Qld. University, Brisbane.

[12] 1926, O. A. Jones, Proc. Roy. Soc. Qld., vol. xxxviii, pp. 23-46.

PYCNOGONIDA FROM THE QUEENSLAND COAST.

By Professor T. Thomson Flynn, D.Sc., University of Tasmania.

(Nine Text-figures.)

Including those from Torres Strait, the number of species of Pycnogonida known from the coast of Queensland comprises only about eight, as follows:—*Nymphopsis armatus* Haswell, 1884, Port Molle; *Rhopalorhynchus kröyeri* Wood-Mason, 1873 (*R. tenuissimus* Haswell, 1884), Port Denison; *Pallenopsis hockii* (Miers), 1884, Torres Strait; *Endeis* (= *Phoxichilus*) *charybdæus* (?) (Dohrn), 1880, Port Molle; *Parapallene australiensis* (Hoek), 1881, Torres Strait; *Parapallene haddonii* Carpenter, 1892, Torres Strait; *Ascorhynchus tenuirostris* Carpenter, 1892, Torres Strait.*

Of the above it is certain that the species believed by Professor Haswell to be identical with *Phoxichilus charybdæus* is different, as might be expected from the greatness of the distance between the two localities at which they were collected. The Queensland specimen is preserved in the Australian Museum as a microscope slide (*G5206*), and proves to be an immature male with three joints developed in the ovigers. The proboscis is longer than in Dohrn's species, being somewhat more than two-thirds of the trunk length. It is impossible to make out the number of cement tubes present. Until such time as fully grown specimens are available I have deemed it advisable not to give the Queensland specimen any specific designation.

The collection whose examination forms the basis of the present paper was obtained from two localities in Queensland by Mr. Melbourne Ward. Though only four species are represented, two of these are apparently new to science. These are *Ascorhynchus melwardi* from 9-12 fathoms in Albany Passage near Cape York, and *Parapallene famelica* from 9 fathoms in Whitsunday Passage. The other two species are also interesting, one of them being *Nymphopsis armatus* Haswell, the other *Pallenopsis hockii* (Miers).

I have to thank the authorities of the Australian Museum, and particularly the Director, Dr. C. Anderson, for accommodation and the use of literature while examining this collection.

DESCRIPTION OF SPECIES.

Genus ASCORHYNCHUS Sars, 1877.

Ascorhynchus melwardi spec. nov.

Specimens.—Holotype male, allotype female, registered in the Australian Museum Collection as *P9345* and *P9344* respectively.

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* The opportunity might here be taken to point out that the generic name *Pallene* instituted by Johnston (Mag. Zool. Bot., i, (4), Dec. 1836, p. 380) is preoccupied by *Pallene* Megerle in Dahl, Col. u. Lep., 1823, p. 56, representing a genus of *Coleoptera* (*fide* C. D. Sherborn). For this reason I propose that the generic name *Pallene* Johnston be replaced by *Callipallene*, the genotype being *Pallene brevirostris* Johnston.

Locality.—Albany Passage, near Cape York, Northern Queensland, 9-12 fathoms, coll. Mel. Ward, Sept. 1928.

Description.—The body is generally slender and hirsute, the hairiness being much more evident in the male than in the female. The trunk is slender and definitely segmented. The crurigers are long and slender, separated from

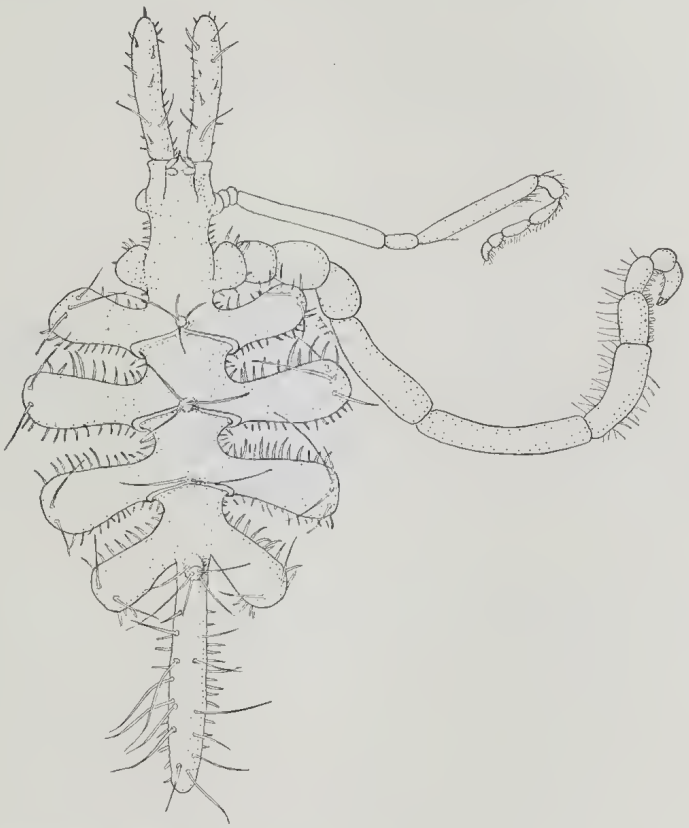

Figure 1.—*Ascorhynchus melwardi* spec nov. Holotype male; dorsal view with legs omitted.

one another by spaces equal to or a little more than their own width. The posterior edge of each trunk segment is produced dorsally into a median more or less sharply pointed process beset by long spiny hairs. There are four of these processes, the most posterior being much higher and stronger than any of those in advance of it. The ocular tubercle is situated over the origin of the palps, only a short distance from the anterior edge of the cephalon. Just in front of the first pair of crurigers there is a slight narrowing of the cephalon forming a somewhat indefinite neck. The length of the cephalon is just about one-half the remaining trunk length, and is somewhat more than half the width of the trunk across the first pair of crurigers. The position of the ocular tubercle has been noted. It is of moderate height, cylindrical in its lower portion; above, it is conical with a sharply pointed process directed slightly backward. The eyes are well developed. The anterior pair is larger than the posterior. The proboscis is fairly long and reaches on the ventral side to the middle of the hindmost trunk

segment. It is of typical shape for the genus except that the distal third is more than usually tubular. The proboscis, at about one-fourth the distance from its base, is encircled by a shallow groove.

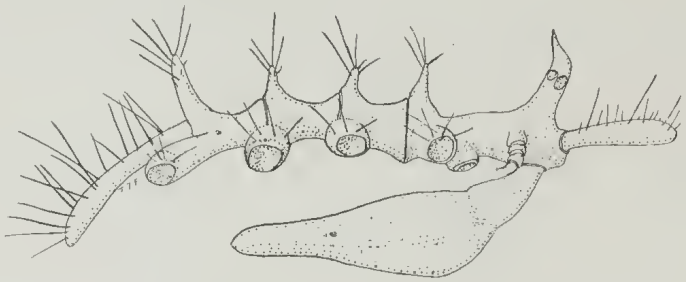

Figure 2.—*Ascorhynchus mclwardi* spec. nov. Holotype female; lateral view with legs, ovigers, and part of the palps omitted.

The abdomen is long and slender. It is slightly curved with the convexity upward. Posteriorly it is directed somewhat downward. The chelophores are represented by their scapes only, and these are undivided. There is no trace whatever of the chela joint. Spines and long hairs are present on the scapes. These are better developed in the case of the male than of the female. The palps are ten-jointed. The ovigers are ten-jointed. The final joint has a small chelate extremity.

Legs:—The coxæ have the usual arrangement. The first and third are short, the third being the longer of the two, while the second is about one and a-half times as long as the first. Of the remaining joints of the legs the first tibia is the longest, being about four times the length of the first coxa and a little longer than the femur. The length of the second tibia may vary in the same individual. In the leg drawn in text-figure 3 this joint is about equal to the femur, but sometimes it has a length more nearly approaching that of the first tibia. At the distal extremity of the femur there is a prominent process well provided with spines. There is a similar process, somewhat smaller, at the end of the first tibia. These processes are present in both sexes.

In this species the trunk and appendages are extremely spinous, this condition being much more evident in the male than in the female. The general arrangement, however, is the same in each. There is, first, a series of short spines which range themselves laterally along the trunk, even appearing at the sides of the neck and also springing from the base of the dorsal trunk elevations. From the trunk they are continued on to the crurigers, where they have a very regular arrangement and are better developed on the anterior surfaces than on the posterior.

There are also to be found very much longer hairs arranged in groups of two or three or more. Such a group is present on each of the dorsal trunk elevations, particularly well developed on the most posterior. They are also to be found at the extremities of the crurigers, on the dorsal side of the abdomen, and on the chelophore scapes.

The above description applies to the male holotype. In the female allotype the arrangement of the spines and of the hairs is about the same, but they are much smaller, so that the female seems to be almost smooth.

In the case of the legs the lateral body spines are continued to the first coxa, but are poorly represented on the second. The most characteristic feature of the remaining joints of the legs is the presence of the spinous processes at the extremities of the femur and of the first tibia. The claw is fairly short and stout.

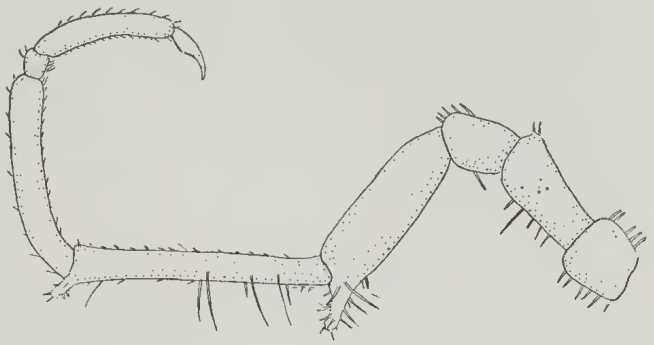

Figure 3.—*Ascorhynchus melwardi* spec. nov. Third right leg of holotype male.

Genital openings:—The female openings are wide apertures situated ventrally at the distal ends of the second coxæ of all the legs. The male openings are smaller, and are placed on slight elevations on the ventral sides of the second coxæ of the posterior two pairs of legs.

MEASUREMENTS, IN MM.

	Male Holotype.	Female Allotype.
Proboscis—		
Length	4.00	4.40
Greatest diameter	0.90	1.30
Trunk—		
Length	4.05	4.40
Width across second crurigers	2·56	2·70
Diameter between first and second crurigers	·55	·65
Cephalon, length	1.45	1.60
Abdomen, length	2·30	2·55
Chelophore, scape length	1·40	1·65
Third right leg—		
First coxa	·70	·77
Second coxa	1·08	1·05
Third coxa	·70	·87
Femur	2·20	2·80
First tibia	2·80	3·07
Second tibia	2·40	2·97
Tarsus and propodus	1·60	1·90
Claw	·52	·45

Affinities.—This species belongs to the group of the species of the genus which, as well as possessing the claw on each of the anterior pair of legs, has the tarsus much shorter than the propodus, and the ocular tubercle not so far removed from the anterior edge of the cephalon. In this group are to be

included *A. cryptopygius* Ortmann 1891, *A. latipes* (Cole) 1906, *A. arenicola* (Dohrn) 1881, *A. abyssi* Sars 1891 (*A. tridens* Meinert 1899), *A. castelli* (Dohrn) 1881.

The only other representative of the genus so far obtained from Torres Strait is *A. tenuicollis* Carpenter 1892, collected by Dr. Haddon. This agrees with *A. melwardi* in the general slenderness of the body, but differs in the absence of the high dorsal trunk processes, in the form of the ocular tubercle, in the form and proportions of the proboscis, in the presence of a rudimentary chela, and in many other points.

In the absence of any trace of the chela *A. melwardi* apparently differs from all previously described species of the genus.

Genus NYMPHOPSIS Haswell, 1884.

Nymphopsis armatus Haswell, 1884.

Specimen.—One specimen, female (juv.), Australian Museum, Reg. No. *P9341.*

Locality.—Dredged in 9 fathoms near Lindeman Island, Whitsunday Passage, East Coast, Queensland, coll. Mel. Ward, Sept. 1928.

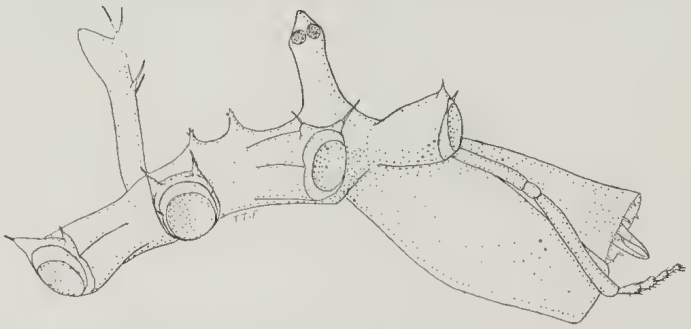

Figure 4.—*Nymphopsis armatus* Haswell. Lateral view of trunk with legs and ovigers omitted.

Remarks.—The holotype of Haswell's species is preserved in the Australian Museum as a microscope slide (*G5201*). Loman (1928, p. 41) has suggested that *N. korotnewi* Schimk., 1887, may be synonymous with *N. armatus* Haswell.

Comparison of the specimen collected by Mr. Ward with the type shows that some important features have been overlooked in my previous revision of the description of the holotype (1919). There are in the holotype between the ocular tubercle and the abdomen two dorsal trunk elevations seen with difficulty in the holotype slide. They are to be well seen in the specimen from Whitsunday Passage. Such elevations are to be found now in all species of the genus except *N. korotnewi* Schimk. In *N. armatus*, however, the elevations are of very moderate height as compared with other species. Another point is that the abdomen bears two pairs of pinnate spines instead of one pair as stated in my former description. The second pair is situated on the same face of the abdomen somewhat lower down.

In the holotype it is impossible to make out the structure of the ovigers. In the specimen collected by Mr. Ward these appendages give evidence of immaturity. Each consists of ten joints. It is surprising to find that the limb is terminated by a small but distinct claw. This has not so far been recorded as occurring in any other member of the genus. It is unfortunately impossible to determine whether such a claw is present on the oviger in the holotype.

Figure 5.—*Nymphopsis armatus* Haswell. Left oviger (x 10).

The chelophores are well developed in the Whitsunday Passage specimen, and in this as in the holotype the chela shaft consists of one joint.

Affinities.—A full consideration of the structure of the two forms indicates that it is not possible to regard *N. korotneui* as a synonym of *N. armatus*.

N. armatus is obviously very closely related to *N. anarthrus* Loman, 1928, with which it agrees in the unjointed nature of the chelophore scape and in the presence of two dorsal trunk elevations. The latter species, recorded by Loman from the coast of Venezuela (1928), is devoid of auxiliary claws, and in it, too, the trunk elevations are very high and pointed. Further, *N. armatus* differs from all other species of the genus in having but two pairs of large pinnate spines on the abdomen. In all others there are four pairs.

Genus PALLENOPSIS Wilson, 1881.

Subgenus RIGONA Loman, 1908.

Pallenopsis (Rigona) hoekii (Miers), 1884.

Phoxichilidium hoekii Miers, 1884, p. 324, plate xxxv, fig. B.

Pallenopsis hoekii Carpenter, 1893, plate ii, fig. 11.

Pallenopsis (*Rigona*) *rigens* Loman, 1908, p. 68, taf. ix, figs. 128-133.

Specimen.—One male, Australian Museum Reg. No. *P9343*.

Locality.—Dredged in 9-12 fathoms, Albany Passage, near Cape York, Northern Queensland, coll. Mr. Mel. Ward, Sept. 1928.

Remarks.—This male agrees very well in its structure with the description of the holotype as given by Miers. His statement that the divisions between the segments appear only on the ventral side is true for this specimen also. The trunk is somewhat broader than is indicated in Miers's figures. Miers's drawing of the oviger leaves much to be desired, especially with regard to the last few joints. It is correctly depicted by Carpenter (1893, plate ii, fig. 11).

Some of the spines on the legs of this species resemble those found in *P. crosslandi* Carpenter, 1910, and in *P. alcocki* Calman, 1923. There is no doubt

that *P. hoekii* is closely related to these species, but is easily distinguished by the differences in the proportions of the joints of the legs. In *P. alcocki* and *P. crosslandi* the second tibia is distinctly longer than the femur, while in *P. hoekii* the two joints are subequal.

There does not seem to be any reasonable doubt that *Pallenopsis* (*Rigona*) *rigens* Loman is identical with this species. As Loman (1908, p. 71) points out, he had not been able to see the description of *P. hoekii*. Apparently the only difference is that the legs in Loman's specimen are slightly longer in proportion to the trunk length than is the case with those which have been put with certainty into Miers's species. As, however, agreement in other respects seems to be quite close, I feel that there is no question as to the validity of the synonymy suggested.

MEASUREMENTS, IN MM.

Proboscis, length	2·4
Trunk—	
Length	4·0
Width across first erurigers	3·0
Width between first and second erurigers	1·0
Cephalon, length	1·5
Posterior right leg—	
First coxa	1·0
Second coxa	2·2
Third coxa	1·2
Femur	4·9
First tibia	5·4
Second tibia	4·2
Tarsus and propodus	1·8

Genus PARAPALLENE Carpenter, 1892.

Parapallene famelica spec. nov.

Specimen.—Holotype male, Australian Museum, Reg. No. *P9342.*

Locality.—Dredged in 9 fathoms near Lindeman Island, Whitsunday Passage, coll. Mr. Mel. Ward, December 1928.

Description.—The body is quite smooth; the trunk is slender, elongated, and distinctly segmented. Anteriorly the cephalon is slightly expanded with a slight median longitudinal groove. The cephalon is equal in length to half the remainder of the trunk. All trunk segments are long and thin, but the most posterior is shorter and more slender than the others. The erurigers are very short and are separated by very wide interspaces equal to about four times their own diameter. The ocular tubercle is a low rounded cone with a terminal point. The visual elements are well developed. The proboscis is short and cylindrical, and is contracted in the midregion. At the anterior end it has the shape of a very shallow cone. A peculiarity is the presence, on the ventral side of the proboscis, of two distinct tubercles, one at each antero-lateral angle. The tubercles are separated by a median groove. The abdomen is very short,

erect, and tubular. The chelophores are short and robust with the chela placed transversely in front of the mouth. The scape is short and thick, expanded towards the extremity. The length of the scape is about two and a-half times its mean width. The hand is slightly longer than the scape. The palm is stout and rounded, with a wreath of short bristles round the base of the fingers. The fingers are short, with smooth blades which have a slight tendency to cross at the extremities. The moveable blade is external. The ovigers are ten-jointed, with incomplete separation of the third and fourth joints. A long terminal claw is present which is finely toothed.

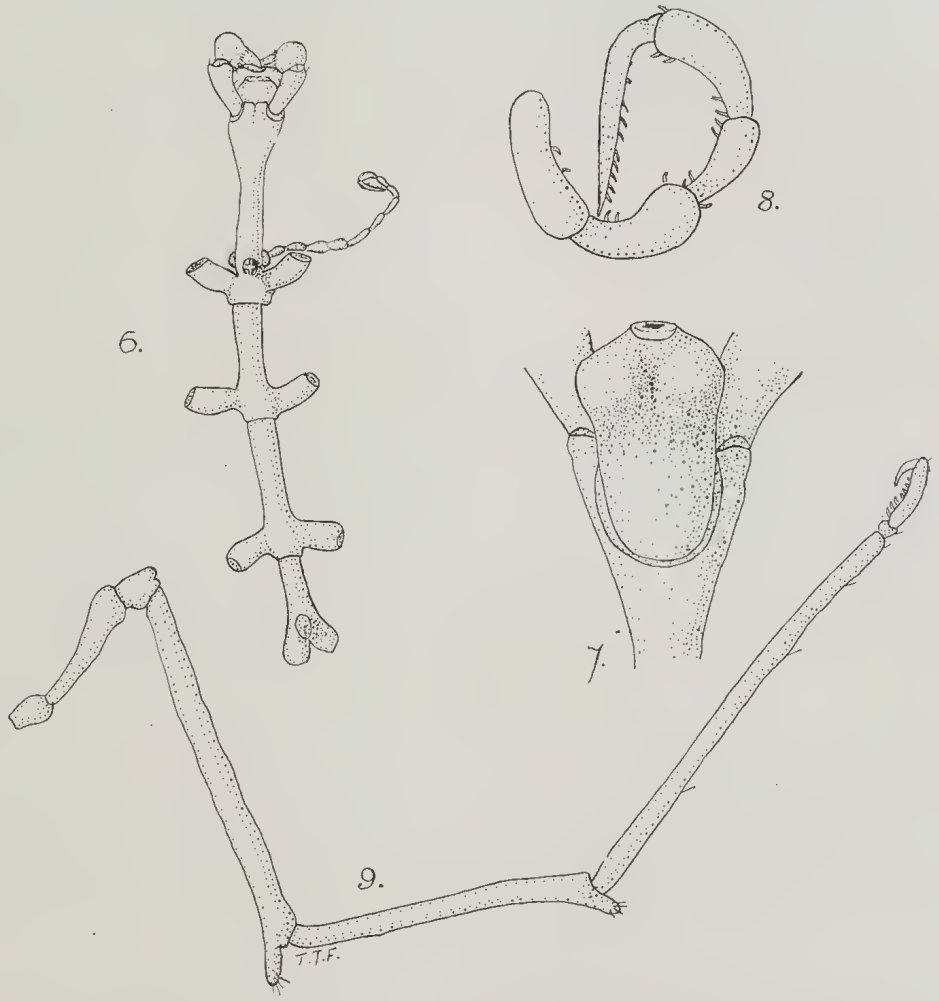

Figure 6.—*Parapallene famelica* spec. nov. Holotype male; dorsal view omitting legs.
Figure 7.—*Parapallene famelica* spec. nov. Holotype male; ventral view of proboscis.
Figure 8.—*Parapallene famelica* spec. nov. Holotype male; terminal joints of the oviger.
Figure 9.—*Parapallene famelica* spec. nov. Holotype male; third left leg.

The legs are extremely long and slender. The first and third coxæ are short, the second is about two and a-half times the length of the first. The

femur is long and slender, a little shorter than the three posterior trunk segments taken together. At the distal end the femur bears a spinous projection. A similar projection occurs on the first tibia. This latter joint is somewhat shorter than the femur. The second tibia is extremely long and slender; it is equal in length to the trunk excluding the last segment. The claw is fairly stout. There are no auxiliary claws.

MEASUREMENTS, IN MM.

	Holotype male.
Proboscis—	
Length along ventral surface	1·8
Greatest width	1·0
Trunk—	
Length to base of abdomen	10·1
Width across first erurigers	2·1
Width between first and second erurigers	0·6
Cephalon, length	3·1
Third right leg—	
First coxa	1·1
Second coxa	2·6
Third coxa	1·0
Femur	7·4
First tibia	6·2
Second tibia	9·8
Tarsus and propodus	1·8
Claw	1·0

Affinities.—It is obvious that this species is very closely allied to *Parapallene nierstraszi* Loman, obtained from somewhat deeper water off the coast of New Guinea and Timor (1908, p. 44, taf. ix, fig. 122-127). The present species is, however, much more slender, the segments of the trunk being much longer and the erurigers much more widely separated.

The erurigers are much shorter in *P. famelica* than in *P. nierstraszi*, and the same remark applies to the length of the legs in the two species.

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QUEENSLAND MOLLUSCAN NOTES, No. 1.

By Tom Iredale.*

(Plates XXX-XXXI.)

Twenty years ago, as his Presidential Address to Section D, Biology, of the Australasian Association for the Advancement of Science, at a meeting held in Brisbane, my predecessor, the late Charles Hedley, discussed the Marine Fauna of Queensland, contributing a delightful historical sketch of its investigators, and giving as an appendix a Catalogue of the Marine Mollusca of Queensland. This catalogue has served its purpose well, and it is now time it should be replaced by a more comprehensive and down-to-date list. Such a list I am now compiling, and the present series of notes is explanatory of the additions and emendations to be made.

Immediately upon publication of Hedley's list, Dr. J. Shirley placed on record a large number of "Additions," but these have to be ignored by scientific workers, as they were based upon parcels of shells received from children, and included foreign shells: no discretion was utilised by Shirley, and many marine shells were recorded from inland localities.

Hedley and McCulloch had made a large collection at Murray Island in 1907, and this has never been reported upon. Later, McCulloch collected on the outer portion of the Great Barrier Reef, and Hedley secured many species in his later short trips on the Barrier.

The Rev. Percy Hubbard has been vigorously collecting mostly on the mainland coast near Innisfail, and has brought to light many interesting species. It is noteworthy that the mainland littoral fauna is at present not so well known as that of the reef.

Mr. Melbourne Ward, interested in the study of Crustacea, has never neglected to make good collections of shells from the Capricorn Group, the Torres Straits Islands, and the islands of the Whitsunday Passage. Notes on his collections are here included.

My colleague Mr. G. P. Whitley and I collected vigorously at Michaelmas Cay, off Cairns, in 1926; and calling at Caloundra, South Queensland, on our way back, met with an enthusiastic collector, Mr. C. Nicholson, and made such interesting finds that a note was written on the Caloundra shells. Last spring (1928) I was on Low Island, off Port Douglas, North Queensland, and a separate report is being prepared on the collection there made, but the experience and material has been utilised in this essay.

The Marine Molluscan Fauna of Queensland is composed of three diverse faunulas, the coastal and the reef faunas, the former being divisible into a northern and southern portion. The southern area, which includes Moreton Bay, exposes a faunula very like that of the Sydney district, New South Wales, but with a larger element of tropical forms. The northern area is characterised by mud-living species which range round Cape York and the Gulf of Carpentaria, and as a whole is very distinct from that of the coral reefs lying

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only a small distance from the shore. The coral reef faunula is that of the Indo-Pacific region generally, the species being commonly regarded as identical with those of the Red Sea, Indian Ocean, Philippine Islands, and Polynesia, but more research and more material generally shows slight distinctive features of those of our Coral Sea. However, at present, in most cases identity of species is accepted until the differences are seen to be well marked and constant. It may be placed on record that the marine mollusca of the reefs of the Outer Barrier are providing a large proportion of new records, commonly of shells well known from New Caledonia and other groups to the east. Consequently, numerically the Queensland list is not by any means representative of the fauna living on the coast and reefs. In this essay over one hundred species are added, and fully as many have not been determined exactly yet, mainly from the Michaelmas Cay collection, while the minute faunula is yet untouched.

The beautiful illustrations (Plates XXX-XXXI) have been prepared by Miss J. K. Allan, of the Australian Museum, to whom my sincere thanks are here tendered.

Solemya terræreginæ sp. nov.

(Plate XXX, fig. 13.)

Small specimens of this genus not hitherto recorded from Queensland were dredged in 10–12 fathoms off Michaelmas Cay, North Queensland, and in the Australian Museum collection similar small shells were found, which had been collected by Hedley at Goode Island, Torres Strait, Annam River, Stareke River, Green Island, and Masthead Island in 17–20 fathoms, but had always been put aside on account of their small size. In order to record the genus, which also adds a family (and even a super-family according to Dall's classification) to the Queensland list, this small shell is regarded and described as new. Shell small, equivalve, very inequilateral, gaping at both ends. Colour white, covered with a thick shining periostracum which extends a long way past the margins; colour of periostracum pale yellow with darker radials. Both ends rounded, the ventral margin parallel with the umbonal margin, the umbones at about the posterior fourth; riblets obscure, about fifteen in number, ten anteriorly and five posterior. Hinge normal; interior dirty-white. Length 11 mm.; height 4 mm. Periostracum extending 1·5 mm. past the margin of the shell.

Nuculana caloundra sp. nov.

(Plate XXX, fig. 17.)

A not uncommon shell on the beach at Caloundra, South Queensland, was recognised as having the shape of *dohrni* Hanley, and it was a surprise to find it had the sculpture of *crassa* Hinds, under which name it appears in Hedley's list.

Shell elongate, beaked, umbones submedian, solid. Colour translucent dirty-white. Sculpture consists of spaced ridges, flattened and rather widely spaced, forty or fifty in number; lunule narrow, radially threaded, and limited by a fine ridge, the rostrum marked by a strong keel and bisected by a similar one, transversely crossed by similar ridges to those of the body of the shell; anteriorly an indistinct angulation occurs. Teeth long, triangular, about sixteen on each side. Length 13·5 mm.; height 7 mm.

Family ARCIDÆ.

This family continues to offer novelties whenever any series is collected. The Rev. Percy Hubbard sent some shells from Innisfail, and two were not easily located. Then one was found to agree with *Arca crebricostata* Reeve (Conch. Icon., vol. ii, Arca, pl. ix, sp. and f. 61, March 1844: the original locality being unknown), an unexpected addition to the Australian list. This species had not been seen since his description, and is referable to *Anadara* Gray. The other provided an interesting case, as one valve was found to differ in shape and sculpture from the other, and the record of *Arca clathrata* Reeve in the Queensland list was made on one valve. Reeve's species was described from the Philippines, was equivalve, the valves similarly sculptured, and the name is preoccupied and therefore invalid. Consequently, the shell from Innisfail is here described as a new species, and, as it does not seem to fall into any well-known group, the new generic name *Imparilarca* is introduced, *I. hubbardi* being named as type.

Imparilarca hubbardi gen. & sp. nov.

(Plate XXX, figs. 1, 2.)

Shell elongate oval, convex, inequivalve, subequilateral, umbones distant, ligament area very large, strongly angulate posteriorly. Colour of dead shells brownish white. Left valve with twenty to twenty-two ribs, which are elevated with deep narrow interstices less than the width of ribs; these are strongly corrugated marginad (that is, towards the margin), nodulous umbonad (that is, towards the umbo), interstices notably concentrically striate, anterior ribs not differing, posterior ones more distant and less corrugated. Right valve with twenty-two to twenty-four ribs, narrow elevated with deep broad interstices more than width of ribs which are smooth, anterior ones showing modified corrugation, strong keel posteriorly, posterior ribbing not crenate. Length 50 mm.; height 35 mm.; depth of conjoined valves 32 mm.

First sent by the Rev. Percy Hubbard, after whom I have great pleasure in naming it, from Innisfail, this species has been found to extend along the whole coast of Queensland from Caloundra to Cape York. It had been determined as *Arca clathrata* Reeve, but the description does not altogether agree, and the name is invalid. Reeve's *chalcanthum* (Conch. Icon., vol. ii, pl. vii, sp. and f. 43, Feb. 1844) from the Philippines belongs to this series, but is decidedly not conspecific, being quite a different shape. Our species is more like Reeve's *rotundicostata* (id. ib., pl. vii, f. 46) from unknown locality, but that species is described as equivalve, and the right valve is figured with nodose sculpture.

A specimen in the Australian Museum from North-west Australia, measuring 65 by 40 by 45 mm., is apparently referable to this species, and shows a blackish brown periostracum between the ribs marginad. This specimen had been compared by the late E. A. Smith with Reeve's types in the British Museum, and it was returned as a new unnamed species.

Rochefortia excellens Hedley.

This species was well figured by Hedley (Rec. Aust. Mus., viii, p. 134, pl. xl, figs. 5, 6, 7, 8, May 6, 1912) from Green Island, and it is obviously out of its generic location. Later he identified his species with *Pythina cumingii* A. Adams (Proc. Zool. Soc. (Lond.) 1856, p. 47: Philippine Islands) and placed it in the genus *Lepton*. It was very common as valves on Michaelmas Cay, and I here propose the new generic name *Barrimysia*, naming *R. excellens* Hedley

as type. It is just as incongruous in *Lepton* as in *Rochefortia*, and I have shown that *Mysella* Angas has precedence over *Rochefortia* Velain, and no Australian conchologist could class the present species under *Mysella*. Another species which needs separation even more is Hedley's *Rochefortia viastellata* (Proc. Linn. Soc. N.S.W., vol. xxxiv, p. 429, pl. xxxvi, figs. 11, 12, 1909), for which I introduce the new genus *Fastimysia*, as the sculpture is very distinctive, and no one would regard it as congeneric with the southern *Mysella*.

Family CARDIIDÆ.

Many more species than are listed occur in Queensland, and in the genus *Fragum* alone the small specimens collected at Michaelmas Cay provided much study, and, while many more may need description, one only is here offered. For the prickly species of *Fragum*, H. and A. Adams introduced *Ctenocardia* (Gen. Rec. Moll., vol. ii, p. 459, 1857), and the type is here named as *hystrix* Reeve (Conch. Icon., vol. ii, pl. viii, sp. 40, Nov. 1844), as that species was given by Fischer as of Broderip, but the authority is Reeve as above cited. The name is preoccupied by Solander (Cat. Mus. Portl., p. 116, 1786), so I rename the beautiful Reevean species *Fragum (Ctenocardia) symbolicum* nov. Included in the Queensland list is *Cardium imbricatum* Sowerby (Proc. Zool. Soc. (Lond.) 1840, p. 110, 1841; Swan River), which is also a species of this group. Sowerby's choice was anticipated by Born (Index Test. Mus. Vindob., "1778," p. 29, 1780), so that the West Australian shell is here renamed *Fragum (Ctenocardia) perornatum* nov.

Fragum whitleyi sp. nov.

(Plate XXX, fig. 14.)

Shell small, solid, very inequilateral, obese, submedially angulate. Colour creamy white. Sculpture consists of about twenty-six radials, elevated with narrow interstices; the anterior series number sixteen and bear closely set, somewhat flattened, elongate scales which degenerate into circular nodules anteriorly; posterior area a steep slope and carrying ten short ribs on which the nodules are circular; interstices finely latticed; margin sharply toothed by ribs; interior pure white. Hinge-teeth and muscle scars normal. Height 12·5 mm.; breadth 10·5 mm. Not uncommon at Michaelmas Cay. Apparently does not grow much larger.

This delightful little species is named for my colleague, Mr. G. P. Whitley, who has always been of great assistance to me in collecting, especially at Michaelmas Cay, and at Low Island, North Queensland.

Pardosinia colorata gen. & sp. nov.

(Plate XXX, figs. 9, 10.)

A beautiful painted "*Dosinia*" attracted me at Michaelmas Cay, and it was astonishing to find it undescribed.

Shell small, circular, thin, rather compressed, lunule small, narrow, escutcheon obsolete. Colour distinctive, purple-brown zigzag lines radiating from the umbones, breaking into angulate markings which tend to disappear when shell is half grown, when four or five radial rows of broken brown lines, four or five lines in a row, persist; young shells completely coloured. Sculpture consists of fine lamellæ, very closely set at umbones, widening and puckering

laterally, but never becoming much elevated, so that about one hundred may be counted without taking in the umbonal striæ. Hinge broad, shallow, adductor muscle scars small. Pallial sinus very long, reaching nearly across and above the scar. Height 28 mm.; length 30 mm.; depth of single valve 7.5 mm.

Pardosinia alma sp. nov.

(Plate XXX, figs. 15, 16.)

Another "*Dosinia*" found at Michaelmas Cay also showed peculiar colouration resembling that of the well-known Venerids, *toreuma* and *embrithes*, classed under *Cytherea* in Hedley's Queensland list.

Shell small, circular, solid, little compressed, lunule small, much impressed, escutcheon ill-defined. Colour distinctive, red-brown blotches arranged radially in four rows, overridden towards the margin by continuous angulate lining, lunule brown. Sculpture consists of regular elevated lamellæ, fifty to sixty being counted before the umbonal smaller, more crowded, ones are reached; these frill a little towards the edges. Hinge fairly broad and deep, adductor muscle scars small. Pallial sinus long and narrow, extending more than halfway across. Height 25 mm.; length 26 mm.; depth of single valve 9 mm.

Bonartemis stabilis gen. & sp. nov.

(Plate XXX, figs. 3, 4.)

Apparently the Dosinids have been neglected, as at Caloundra still another undescribed species was collected by Whitley and myself.

Shell small, subcircular, very solid, beaks much incurved, lunule very deeply impressed, heart-shaped, broad, escutcheon long, well defined and bordered. Colour cream with brown, broad, radial splashes four in number. Sculpture consists of coarse but closely set lamellæ, forty in number, till the umbones are reached, where they still exist as coarse and distant lamellæ; on each side the lamellae show a strong tendency to becoming frilled. Hinge rather narrow, very deep and crass, adductor scars large. Pallial sinus very short and angulately narrow, reaching less than halfway across. Height 29 mm.; length 29 mm.; depth of single valve 10 mm.

Heteroglypta hedleyi sp. nov.

The name is proposed for the shell from the Nambucca River, Northern New South Wales, described and figured by Hedley under the name *Asaphis contraria* (Proc. Linn. Soc. N.S.W., 1900, p. 731, pl. xlviii, figs. 4-8, May 20, 1901), which differs from *Psammobia contraria* Deshayes (Cat. Moll. Ile Reunion, p. 11, pl. 1, f. 20-21. 1863) from the Isle of Reunion (Bourbon) in shape and sculpture. It does not seem to have much relationship with *Asaphis*, as when Dall so placed it (Trans. Wagner Free Inst. Science, iii, pt. v, p. 981, 1900) he was autoptically unfamiliar with it. Moreover Martens had introduced the name *Heteroglypta* (Beitr. z. Meeresf. Maurit. u. Seych., p. 331, 1880) for it alone.

At Michaelmas Cay valves of a similar shell were found, and these upon autoptical comparison with the southern types were seen to be also slightly different in sculpture and shape; the northern shell is white, more elongate, more inequilateral, the posterior end shortened, ventral edge less rounded,

anterior end slopingly truncate, the sculpture a little finer; the muscle scars are more regular than shown by Hedley, the sinus being normal: measuring 12 x 8 mm., a larger one 14 x 9 mm. This may be named *H. avecta* sp. nov.

From New Caledonia a small cream shell measuring 9 x 7 x 5 mm. is shorter, more obese, posterior end a little attenuate, the posterior angle more acute, sculpture a little coarser, gaping anteriorly and with the ventral edge sinuate, and is here named *H. pansa* sp. nov.

An odd shell is here figured (Plate A, figs. 5, 6) and named *H. saltatrix* sp. nov. It is from Michaelmas Cay, and differs in shape, as otherwise it might be regarded as an aberration. The posterior end is somewhat acutely attenuate, the ventral edge well rounded, anterior edge nearly straight, abruptly truncate; the valve measures 18 x 12·5 mm. The sculpture is erratic; the figure will explain this better than any description. Hedley gave a good description of the species I have named *H. hedleyi*, and divided the shell surface into four panels, and in this shell the anterior panel is subdivided into three. It may be noted that the umbonal sculpture is normal concentric ridging, the peculiarities developing later.

Family TELLINIDÆ.

This family demands study, as there are scores of unnamed species now accumulated in the Australian Museum and every collection adds to the number. The working out of the genera is a prime necessity, and it will be a difficult task, as so many different types have become associated. Thus I cannot find a place for such a well-known shell as *Tellina rugosa* Born, and this may be due to pure carelessness, as I find that although Born pointed out, when he introduced his species, that his name was preoccupied no correction has yet been made. Fortunately there is an excellent figure given in Martyn's Univ. Conch., pl. 138, 1787, with the name *Cochlea palatam* from China, so that a general name is readily available. The Queensland shells have more pronounced sculpture, are more elongate, and have narrower beaks, and may be later separable. As the species cannot be classed in *Tellina* (s. str.), a different generic name *Quidnipagus* is here proposed, naming Martyn's *Cochlea palatam* as type.

Many smaller species with names may be here added to the Queensland fauna. Two small Tellinids with wavy-line sculpture may be classed together with the new name *Jactellina*, naming *Tellina obliquaria* Deshayes as type; these are *Tellina obliquaria* Deshayes (P.Z.S., 1854, 356; habitat unknown: Sowerby, Conch. Icon., xvii, pl. liv, sp. 321, Oct. 1868), and *Tellina balansæ* Bertin (Nouv. Arch. Mus. Paris., ser. 2, vol. i, 1878, p. 275, pl. ix, f. 10 *a*, *b*: New Caledonia). A species a little different may be here placed temporarily: *Tellina hungerfordi* Sowerby (Proc. Mal. Soc. (Lond.) i, 159, pl. xii, f. 22, 1894: Hong Kong).

Two other small species may be included in a new genus *Obtellina*, the first-named being selected as type, viz: *Tellina bougei* Sowerby (Proc. Mal. Soc. (Lond.) viii, p. 200, fig. in text. Apl. 1909; I. of Monac, New Caledonia); and *Tellina obtusalis* Deshayes (P.Z.S., 1854, 355: Sowerby, Conch. Icon. xvii, pl. xlvii, sp. 281, Oct. 1868).

In the Queensland list appears *Tellina rhomboides* Quoy and Gaimard, and as that name was preoccupied a substitute was necessary, and there was a series of synonyms apparently to select from. An unquoted one, however, in *Tellina clathrata* Deshayes (Hist. Anim. s. Vert. (Lam.) vi, p. 208, 1835, introduced for Quoy and Gaimard's figures, pl. 81, figs. 4, 5, 6, 7) effectually stifled all opposition, as it had appeared before Q. & G.'s letterpress.

Salmacoma vappa gen. & sp. nov.

(Plate XXX, figs. 7, 8.)

A Tellinid of the "*Macoma*" style. *Macoma* was founded on the Palæaretie *Tellina balthica* Linné, with whieh the Australian so-called species have nothing in eommon save laek of lateral teeth.

Shell of medium size for the family, thin, inequivalve, valves nearly equilateral but strongly twisted, edge of valves markedly sinuous, valves eonvex, left more tumid than right, beaks subcentral. Colour salmon-eream shading into salmon-pink on umbones and margins. Seulpture consists of fine concentric growth lines more pronounced towards the margins. Hinge with two small teeth in left valve, one bifid, other scarcely so; in right valve, one not bifid. Pallial line advancing aeross from base of musele scar towards the other, whieh in the left valve it does not reach by about 4 mm., but in the right rising higher up and becoming subangulate below the umbo becomes confluent with the opposite musele sear. Length 33 mm.; height 24 mm.; depth of eonjoined valves 16 mm.; right 6, left 10.

Colleeted by the Rev. P. Hubbard, at Innisfail.

Family MACTRIDÆ.

Sinee Hedley's list appeared Smith published A List of the Australian Maetridæ (Proc. Mal. Soc. (Lond.) xi, pp. 137-151, June 1914), and that essay may be here commented upon.

Smith has regarded *Mactra abbreviata* Lamarek (Hist. Anim. s. Vert., v, p. 477, 1818: "Port Jaekson") as equivalent and anterior to *obesa* Deshayes. It may be noted that throughout the paper Smith preferred Deshayes' names to those of Reeve, but the latter were published first as aceepted by Hedley in his list. In this instance *obesa* was published by Reeve (Conch. Icon., viii, f. 19, March 1854) from Torres Straits, and that would be the correct name for the North Queensland shell. Smith would regard as a variety only the form *meretriciformis*, also introduced by Reeve (loc. cit., f. 18, March 1854) from Port Essington. It would be nearer the truth if Lamarck's species *abbreviata* were regarded as coming from Shark's Bay, Western Australia, as while Lamarck had plenty of shells from that locality he had very few if any from North Queensland. Hedley has ineluded *M. abbreviata* in his Western Australian list, without eomment or synonymy.

Under the name *Mactra luzonica* Deshayes, Smith gives loealities "Luzon, Middle Harbour and Botany Bay, Sydney (Angas), Queensland (Hedley for *apicina*)."

Reeve's *apicina* (loc. eit., pl. xix, sp. 111, May 1854) appears to be based on an immature speeimen from unknown loeality, and may be identieal with Reeve's *luzonica* (loc. cit., pl. xvi, sp. 81, May 1854) from the I. of Luzon, but the Queensland shells agree better in shape with Reeve's *M. decora* (loe. cit., pl. xvi, sp. 80, May 1854), again from unknown locality, but my specimens lack the coloured rays. From Caloundra, South Queensland, large specimens are commonly seen, and these rather mimic the northern form of *rufescens* in shape but not in sculpture, and is probably the species mentioned by Smith from Queensland under that name.

The hinge-teeth of these shells differ appreciably from those of *M. obesa* Reeve above mentioned, and therefore I introduce the genus *Telemactra*, naming *M. obesa* Reeve as type.

Smith described a new species, *Mactra queenslandica* (id. ib., p. 148, fig. in text), from Sandgate, S.Q., and for this I propose a new generic name *Colorimactra*, and describe an allied species as—

Colorimactra florens sp. nov.

(Plate XXXI, fig. 16.)

Shell small, ovately trigonal, a little inequilateral, somewhat compressed. Colour greyish purple, shining, colour zoned through growth lines; deeper near the umbones and then at the ventral margin; inside dark reddish purple, darker and duller internally, shining towards the edges. Anteriorly rounded, the lunule is not well defined save by radial lirae; posteriorly, a strong sharp keel is prominent, the escutcheon in the keeled area being boldly radially lirate; the lirae stopping before the keel is reached but not bounded by any raised line; otherwise the shell is smooth and shining, the almost imperceptible growth lines showing a little strength near the margins. The pallial sinus is short and rounded: hinge-teeth as in *M. queenslandica* Smith.

Length 23 mm.; height 19 mm.; depth of conjoined valves 9 mm.

Collected by the Rev. Percy Hubbard at Innisfail, North Queensland.

Differs from *M. queenslandica* Smith, of which it may be the northern representative, in its stronger posterior angulation and the convex, not concave, lunular anterior side.

When Dall provided a Synopsis of the Genera of Recent and Tertiary Mactridæ (Proc. Malac. Soc. (Lond.) i, pp. 203-213, March 1895) he allowed a subfamily Lutrariinæ with genera *Lutraria* (three sections, *Lutraria*, *Goniomactra*, and *Lutrophora*), *Tresus*, *Standella* (with subgenus *Eastonia*), and *Heteroeardia*. *Goniomactra* had been introduced for the Australian *Lutraria impar* Deshayes (Reeve, Conch. Icon., ii, pl. iii, sp. 10, 1854), which is decidedly a distinct form.

Hedley's Queensland list allowed *Lutraria arcuata*, *elongata*, *impar*, *oblonga*, and *philippinarum* with *Standella nicobarica*. The list was a compilation, so that the three names *arcuata*, *oblonga*, and *philippinarum* are found to refer to the same species, and the best name for that appears to be *australis*, given by Deshayes and first published by Reeve (Conch. Icon., ii, pl. iii, sp. 8, 1854: Moluccas). Gray's *Lutraria elongata* (Mag. Nat. Hist. (Jard.) i, 374, 1837) was anticipated by Muenster (N. Jahrb. f. Min. 435, 1835), and may be here renamed *Lutraria* (*Lutromactra* nov.) *impedita* nom. nov.

Standella hubbardi sp. nov.

(Plate XXX, figs. 11, 12.)

The species *Standella nicobarica* of Hedley's Queensland list must bear the new name *Meropesta meridiana*, as, although it has a close resemblance to the Indian shell, when compared it is seen to differ in shape, being higher with the posterior end more rounded, not attenuate, the wrinkled area much less in

extent. The type locality of *M. meridiana* is Lake Macquarie, N.S.W., but the species ranges north to Torres Straits. The genus name *Meropesta* is introduced with that species as type, as it does not appear to be closely related to *Eastonia* (type, *rugosa* Gmelin, from Portugal), and the name *Merope* proposed for the Indian species by H. and A. Adams in 1857 had been used previously by Newman.

The new species now described is a true *Standella*, differing from the type of the genus in form, the anterior side being more produced and the posterior more alternate. It was first collected by the Rev. Percy Hubbard, but I have since collected it at Townsville and the Daintree River.

Shell elongately oblong, thin, posteriorly attenuated, anteriorly rounded, inequilateral, umbones approximate, gaping at both ends. Colour white, covered with a very fine periostracum only noticeable at the posterior end where it is thicker and wrinkled. Superficially the shell is smooth but under a strong lens it is seen to be finely wrinkled. Hinge-teeth exactly as in the type of *Standella;* somewhat delicate and apt to be broken in beach-worn specimens. Pallial sinus very long, rounded, reaching more than halfway across the shell; adductor muscle scars small. Length 45 mm.; height 28 mm.; depth of conjoined valves 16 mm.

Pharella wardi sp. nov.

(Plate XXXI, figs. 5, 6, 7.)

A fine bivalve dredged by Mr. Melbourne Ward in the Albany Passage, North Queensland, introduces a new genus into the Australian list as *Pharella*, was proposed by Gray (Ann. Mag. Nat. Hist., ser. 2, vol. xiv, p. 24, July 1884) for *javanica*, and I name this as type.

Shell large, elongate, equivalve, inequilateral, gaping at each end. Colour white, covered with a pale yellowish periostracum which extends a great deal at the edge. A white zone contrasts with a yellowish one, the periostracum much thicker and wrinkled at the posterior end. Shell smooth save for fine growth lines, the anterior end rounded, the posterior end short, obliquely rounded, the ventral margin a little convex, nearly parallel with the umbonal margin. Ligament large, external. Hinge and muscle scars normal. Inside white. Length 72 mm.; height 22 mm.

Montfortia excentrica sp. nov.

(Plate XXXI, figs. 14, 15.)

This name will replace that of *Subemarginula clathrata* of Hedley's list, who explained his preference for it (Proc. Linn. Soc. N.S.W., xxxiv, 436, 1909), excusing his rejection of *panhi* Quoy and Gaimard on the grounds of purism. There was no need of excuse as *panhi* Q. and G. is quite different in shape from the Australian shell, and the choice of *clathrata* Ad. & Rve. was unfortunate, as not only did it refer to a distinct species but the name was invalid. Thiele (Syst. Conch. Cab. 578te, lief. (Bd. vii. heft xxxvii) 1917, p. 116, pl. 13, f. 12-13) used *panhiensis* Reeve and placed it in *Hemitoma*, but Swainson's description reads, "Patelliform: the fissure not cut through the shell, but merely forming an internal groove," and this does not apply while the sole species. *H. tricostata* Sw., based on Sow. Gen., f. 6, is a West Indian form, so that we can use *Montfortia* Recluz, of which genus I designated *Em. australis* Q. and G. as type (Trans. New Zeal. Inst., xlvii, 1914, p. 435, July 12, 1915). These tropical forms may not even be congeneric, but as the shell shows distinction I here propose *Montfortista* as a new subgenus, with *M. excentrica* as type.

Shell large for genus, very elevated, laterally compressed, apex exeentrie. Colour greenish white, interior green with darker lines, spatula whitish. Seulpture eonsists of strong radials crossed by weaker eoneentric ridges, forming deep pits; anterior slope steep, posterior a little less. The faseiole is filled in forming an elevated ridge roughened with growth stages and showing a short deep slit at edge; on each side of the fasciole lies a stout radial, and behind this some sixteen radials with a few minor intercalating ones can be seen, the whole crossed by about ten ridges; a faint striation can be seen with a glass of fresh specimens, somewhat more pronounced on the radial ribs. Length 21 mm.; breadth 14 mm.; height 16 mm.

Habitat: North Queensland (type. Michaelmas Cay).

Family HALIOTIDÆ.

This family still gives concern as it proves to be more numerous in speeies and groups than has been accepted up to the last few years, and as there is confusion regarding the exact nsage of the genus name *Haliotis* I here provide some more names to be nsed for Australian speeies. The type of *Haliotis* Linné has been commonly regarded as the palæaretie *tuberculata*, and, if so, our different forms need distinctive names. Montfort designated *H. asinina* L. as type, and this needs consideration.

The commonest species on the coral reefs is that known as *varia* Linné, a name which has been applied to a series of forms. Linné described his speeies without reference or locality, and the Philippine Island form has been aeeepted as typical. I here designate that locality as the type locality to provide a basis for work. Dr. Eland Shaw collected a series at Bangaan I., and these do not agree with Australian specimens, being larger, rounded, with less pronouneed seulpture, &c. Associated with the small shell is a mueh larger one which is tentatively determined as *pustulifera* Pilsbry (Man. Coneh., xvi, 1890, p. 96, pl. 23, f. 52). The smaller Australian shell may be subspecifically named *Sanhaliotis varia aliena*, the genus *Sanhaliotis* being introduced for these small speeies, *H. varia* being designated as type. A mueh smaller shell from Lord Howe Island has also been called *varia*, but it is very distinct and may be ealled *howensis*. It differs from *Haliotis hanleyi* Ancey in lacking the smooth space which is so charaeteristic of Ancey's species. This was deseribed (Le Naturaliste, May 1881, p. 414) from the I. Nou, New Caledonia, and as it was not figured has been negleeted. The type, now in the Australian Museum, is here figured (Plate XXXI, fig. 1) and agrees with New Caledonian shells colleeted by Mr. A. F. Basset Hull, and also with speeimens from Lifu recorded as *H. jacnensis* Reeve, and also as *H. dringii* Reeve, neither of which species oeeurs in New Caledonian waters. A valid New Caledonian speeies was described by Sowerby as *H. crebriscalpta* (Ann Mag. Nat. Hist., ser. viii, vol. xiv, p. 478, pl. xix, f. 2, Dec. 1914), and this I reeognised at Michaelmas Cay, North Queensland.

A well-marked little species is here described as *Sanhaliotis dissona* sp. nov. (Plate XXXI, fig. 2). Shell small, elongate, spine depressed. Colour brownish yellow. Seulpture consists of five prineipal eords separated by intervals of about the same width, the ribs rounded, not sealy, but irregularly nodulose; smaller eords interealate, and on the last whorl there are half-a-dozen subsidiary ones between the suture and the primary ones. Orifices depressed, oval, fairly close

together; between the orifices and the basal rim four strong cords can be counted. Columella plate flattened, broad, hiding all the previous whorls. Interior yellowish pearl, shining. Length 28 mm.; breadth 18·5 mm. This was also collected at Michaelmas Cay.

Family TROCHIDÆ.

The species of this family, be they large or small, are always attractive, and much of interest was found at Michaelmas Cay as many species grouped around *T. maculatus* Linné were collected. Of the six species Hedley allotted to *Trochus—calcaratus, fenestratus, hexagonus, maculatus, niloticus,* and *obeliscus* —one, *hexagonus*, must be rejected as it is based on a misinterpretation only. *Trochus niloticus* must be called *Rochia nilotica*, or, perhaps better, *Rochia pagodus*, while *T. fenestratus* and *T. obeliscus* are transferred to *Tectus*. In addition to *T. maculatus* and *T. calcaratus*, some other species were determined as true *Trochus*, thus *T. obesus* Reeve (Conch. Icon. xiii, pl. xii, sp. and f. 75, Dec. 1861; loc.?) and *T. crebrigranatus* Reeve (loc. cit. pl. xv, sp. and f. 89, 1861; loc.?), and a third certainly appeared to agree with *T. fastigiatus* A. Adams (Proc. Zool. Soc., 1851, 150; Reeve, loc. cit. pl. xv, sp. and f. 87, 1861; loc.?).

Genus CALLIOSTOMA.

I have already pointed out that the southern shells so classed have little relation with the true Palæarctic *Calliostoma*, and this conclusion has been confirmed by study of the radulæ by Thiele. I suggested they seemed nearer to *Thalotia* and this appears to be correct. According to a label in the Australian Museum, Hedley's *C. trepidum* is stated to be identical with the earlier *deceptum* of Smith. There are more species of this little group which may be distinguished by the new generic name of *Latifautor*, Hedley's shell being type. Further, the species known as *C. arruense* Watson seems to represent the southern *Thalotia* very closely, and may be separated with the new generic name of *Calthalotia*, Watson's species being type. Another new generic name, *Putchrastele*, is here proposed for *Astele septenarium* Melvill & Standen, and Hedley's *Calliostoma speciosum*, which may not be that of A. Adams, appears congeneric. These species will be elucidated with figures later, as there are some very beautiful species to be described, and all the species are localised in distribution.

To the species of *Clanculus* must be added *C. gatliffi* Tomlin (Proc. Malac. Soc. (Lond.) vol. xvi, p. 24, fig. in text, April 1924: West Australia, Coral Sea). *Gibbula townsendi* Sowerby must be expunged, as Mr. Hedley told me it was included purely in error.

The species allotted to *Monilea* need redistribution, as that generic name needs rejection. Under *Talopia* can be placed *callifera, lentiginosa,* and *belcheri* (since added by Hedley); *nuclea* belongs to *Rossiteria; lifuana* to *Talopena*, while *glaphyrella* might be placed there, though not quite typical; *pudibunda* should be omitted at present as the specimens here so named do not belong to the species; for *henniana* I introduce the new name *Conotalopia*, and *tropicalis* may be included here temporarily.

At Michaelmas Cay many specimens were collected of the shell known as *Minolia agapeta* Melvill & Standen, but whose correct name I have shown to be *Monilea apicina* Gould, and for which I introduce the new generic name *Parminolia*, naming this species as type. Probably more than one species is known under that name. There are shells which occurred numerously and had

been collected previously by Hedley, but which do not appear to have been recorded. These are—*Trochus semiustus* Fischer (Journ. de Conchyl., 1879, p. 23; id., 1886, pl. 1, f. 6: New Caledonia), placed by Pilsbry under *Minolia*, but *Conotrochus* suggested, and *Solariella tragema* Melvill & Standen (Journ. Conch., 1896, p. 313, pl. xi, f. 78: Lifu, New Caledonia), under the subgenus *Conotrochus* and generic value proposed. While the latter was placed in *Conotrochus*, the former was obviously congeneric, and, as the name *Conotrochus* is invalid through having been used by Schroeter in 1863 for a Cœlenterate before Pilsbry's introduction, it is necessary to introduce a new generic name. The new name *Vanitrochus* is proposed, Melvill & Standen's species *tragema* being named as type.

The species under *Euchelus* need redistribution as Brazier's *Clanculus granosus* should be transferred back to *Clanculus*, while *Tallorbis* is now recognised for *roseola* Nevill, and *foveolatus* A Adams is more probably a *Herpelopoma*; a new genus *Vaccuchelus* is introduced for *Euchelus angulatus* Pease (Amer. Journ. Conch., vol. iii, p. 283, pl. 23, f. 27, 1867) which is representative of a large series of Euchelus-like molluscs which lack the basal tooth to the columella, and more than one species occurs in Queensland as well as Pease's shell.

Family TURBINIDÆ.

The Queensland species of *Turbo* (*s. l.*) are difficult to name, while the genera are as puzzling to delimit. Some genera such as those represented by *argyrostomus*, *porphyrites*, *marmoratus*, and the N.S.W. *stramineus* seem easily recognisable, but the names to be used are not so easily determined. The type of *Turbo* is now regarded as *petholatus*, and with it may be classed *militaris* (= *imperialis* of Hedley's list) and *marmoratus*, though the last-named appears at first to differ.

Senectus can be used for the *argyrostomus* series, including *concinnus*, *chrysostomus*, *foliaceus*, *gemmatus*, *nivosus*, *speciosus*, *sparverius*, and *tumidulus*. *Lunella* will then come into use for the *porphyrites* series, which may be easily divided into three—*porphyrites* from New Caledonia, *mespilus* Gmelin (Syst. Nat., pl. vi, p. 3601, 1791: Southern Ocean) from East Queensland, and *porcatus* Reeve (Conch. Icon., vol. iv., pl. xi, sp. & f. 52, March 1848) from West Australia and Western Queensland.

The members of the *Senectus* series are difficult to segregate and the names need rectification. Thus I have shown (Proc. Zool. Soc. (Lond.) 1914, p. 669) that *Turbo foliaceus* Philippi, 1846, was invalid, and must be replaced by *Turbo squamosus* Gray (Narr. Surv. Voy. "Fly," vol. ii, p. 359, pl. ii, fig. 8, 1847) described from Port Essington, Northern Territory.

Turbo concinnus Philippi (Conch. Cab., ed. 2, p. 44, pl. 2, f. 6, 1847) is unavailable, and *Senectus permundus* nom. nov. is proposed to replace Philippi's name. *Turbo nivosus* Reeve (Conch. Icon., vol. iv, pl. x, sp. 43, f. 43-44, March 1848) from the Philippine Islands is invalidated by Montagu (Test. Brit., vol. ii, p. 326, 1803), and Reeve's species is here renamed *Senectus necnivosus* nom. nov. *Turbo speciosus* was described by Reeve (id. ib., pl. viii, sp. 35, March 1848) from New Holland, sent by Dring, but the name has been used by Megerle (Verh. Gesell. Nat. Freunde Berlin, 214, 1824) so I name Reeve's shell *Senectus perspeciosus* nom. nov.

Another name given by Reeve, *Turbo pulcher* (Proc. Zool. Soc. (Lond.) 1842, p. 185), to another shell collected by Dring, this time from Turtle Island, North Coast, must bear Menke's name *intercostalis* (Moll. Nov. Holl, spec. p. 13, 1843), while Philippi's *Turbo intercostalis* (Conch. Cab., 1846, p. 42), must be renamed *Senectus trossulus* nom. nov.

Delphinula turbinopsis Lamarck (Hist. Anim. s. Vert., vol. vi, pt. 2, p. 231, 1822), figured by Delessert (Recueil Coq. Lam., pl. 34, figs. 1, 1*a*, 1841), is obviously the shell from Shark's Bay, West Australia, above determined as *T. squamosus* Gray, an identity not previously recognised.

In Hedley's list *Astralium* was used with four species, *petrosum, nobile, aureum* (typ. error for *aureolum*), and *tentoriiforme*. Since then *Astræa* has been utilised to displace *Astralium* in the broad sense, but more recently *Astralium* has been revived for the *longispina* series, *Astræa* belonging strictly to the New Zealand *heliotropium*.

Bellastræa has been introduced for the "*fimbriatus*" series, with which *tentoriiformis* Jonas was associated, but the name of the South Queensland shell, the same as that at Sydney, is *sirius* Gould, the "*fimbriatus*" type not being yet recognised.

When Hedley described his *A. aureolum* he contrasted it with the Neozelanic *sulcatum* as a second member of the subgenus *Cookia*. It appears, however, to be a gigantic relation of the *Bellastræa* group, probably derived from the *Calcar* series, which is represented in Queensland by two or three species.

At Michaelmas Cay I secured two species not previously listed: *Calcar pileolum* Reeve and *Calcar stellare* Gmelin. Reeve's species was first described as *Trochus pileolum* in the Conch. Syst., pl. 217, f. 5, 1842, and the name has been used for other forms such as *rotularia* Lamarck. The true *Trochus rotularius* Lamarck (Hist. Anim. s. Vert., vol. vii, p. 12, 1822), described from unknown locality, is a West Australian shell, and also occurs in North Queensland. There should be no confusion as the beautiful figure given by Delessert (Recueil Coq. Lam., pl. 34, fig. 9 *a*, *b*, 1841) is sufficient to recognise the species by. The primary reference to *Turbo stellaris* Gmelin reads "Syst. Nat. pt. vi, p. 3600, 1791."

Commoner than these at Michaelmas Cay was *Calcar petrosum* Martyn (Univ. Conch., pl. 124, 1787), said to be from "China," but agreeing in detail with our shell, was probably collected by Cook's party in North Queensland or New Caledonia. Pilsbry (Man. Conch. (Tryon), vol. x, p. 234, 1888) associated with this species other shells which are certainly not conspecific.

Another common little shell at Michaelmas Cay was *Leplothyra lata* Souverbie and Montrouzier (Journ. de Conch., vol. xi, p. 277, pl. xii, f. 2, 1863: New Caledonia). I have shown that *Leptothyra* could not be used, and proposed *Collonista* for these shells, and as Montrouzier's specific choice had been anticipated by Philippi (Zeit. f. Mal., 1848, p. 100, 1849), the New Caledonian shell must be called *Collonista costulosa* Sowerby (Thes. Conch., vol. v, p. 213, pl. xiii, f. 161, 1886) introduced to replace Montrouzier's name.

LEUCORHYNCHIA Crosse.

This genus was introduced by Crosse (Journ. de Conch., xv, p. 320, pl. xi, f. 4, July 1867) for a New Caledonian shell which he named *L. caledonica*.

Twenty years later Tryon (Man. Conch., x, p. 106, pl. 35, figs. 86, *a*, *b*) added a second species, *crossei*, reducing *Leucorhynchia* to subgeneric rank under *Teinostoma*. This was from Singapore, and from the same locality three years later Pilsbry added *L. tryoni* (Nautilus, v, p. 91, Dec. 1891). Then Melvill and Standen increased the number to four with a Lifu species, *L. tricarinata* (Journ. Conch. (Leeds viii, p. 311, pl. xi, f. 75, *a*, *b*, Nov. 12, 1896). Some years ago, I recognised Tryon's species from shell-sand from Shark's Bay, West Australia, and now I report the two New Caledonian species from Michaelmas Cay, thus adding a genus as well as two species to the Queensland list, the genus being also first reported from Australia in this note. Four new species have been recently described by Thiele, 1925.

Genus LIOTINA.

Under this genus name discordant species are arranged, and this opportunity is taken to provide some better names, both generic and specific. Thus the species *crenata* Kiener typifies a peculiar series which may be called *Dentarene*, while, as it was proposed as a species of *Delphinula*, the specific name is invalid through the prior *D. crenata* Sowerby (Genera Shells, pt. 39, 1833), and it is here renamed *Dentarene sarcina* nom. nov. Another species which may be classed with it is *muricata* Reeve, which also needs renaming as there was a *D. muricata* Calcara (Mem. Conch. Altavilla, 1841, p. 75) before Reeve used it, so I rename Reeve's species *Dentarene munitus* nom. nov. A not uncommon shell at Michaelmas Cay agreed with *Delphinula cidaris* Reeve (Conch. Icon., vol. i, pl. v, sp. & f. 27, Oct. 1843: 1, Mindoro, Philippines) save that our shell is more rounded still, the longitudinal ribs not so pronounced, and may be given a subspecific name, *lenullus* nov., the genus name *Globarene* being introduced for it as it has a very small umbilicus and outer lip only thickened, not variced, though the operculum is of the "Liotinid" style.

Family PHENACOLEPADIDÆ.

One of the most attractive shells on the beach of Michaelmas Cay was a species of *Phenacolepas*, and continuous searching found many specimens representing more than one species. Three species were admitted by Hedley in his list, and I had found a broken piece of a fourth at Caloundra; later Sowerby described *P. mirabilis* (Proc. Malac. Soc. (Lond.) ix, p. 66, fig. in text, March 1910) which was the last-named. Simultaneously Thiele monographed the family in the Conch. Cabinet (Mart. and Chem.) 539e lief., Bd. ii, heft xxxiii, 1909), and added *P. reticulata* from Moreton Bay. Hedley had synonymised Melvill & Standen's *P. linguaviverra* from Torres Straits with his *P. senta* from Funafuti, but Thiele has allowed these two as distinct. I agree with this, and moreover find that Hedley's species had been described earlier by Gould as *Capulus sagittifer* (United States Expl. Exped., vol. xii, Moll., p. 383, pl. 32, fig. 486, *a*, *b*, 1852: loc. unknown).

When Hedley introduced his *P. senta* he pointed out that the species did not seem congeneric, and Thiele has also agreed that division was necessary, but did not perform the task. The species on the Australian list were undoubtedly of different origin, and allowing *Phenacolepas* for the species around *crenulata* Broderip, the form *cinnamomea* Gould is here made the type of a new genus *Cinnalepeta*. This species is a mud-dweller, and the animal has been described by Hedley (Proc. Linn. Soc. N.S.W., xli, 1916, p. 707, pl. xlviii, f. 17-19, April 4,

1917) and its range is given as Northern Queensland and New Caledonia as well as New South Wales. Upon comparison the New Caledonian shells are found to be larger and proportionately narrower, and with more numerous ribs with much more pronounced prickles. It may be called *Cinnalepeta vagans* n. sp. The shells from tropical Queensland have closer ribs than the Sydney shells, while their shape is different, the apex more posterior. This form will be later figured, but may here be named *Cinnalepeta escensa* n. sp., the type being from the Annam River, North Queensland.

The sculpture, form, and texture of the *senta–linguaviverræ* group is characteristic, and the new generic name *Zacalantica* is here introduced, the species *linguaviverræ* being named as type. There appears to be more than one species in Queensland. The most curious find at Michaelmas Cay was a shell with a much stronger texture and an apex nearly median and not recurved. It was obviously a distinct type and is here named *Amapileus*, the new species here described being named as type.

Amapileus immeritus sp. nov.

(Plate XXXI, fig. 8.)

Shell small, conical, apex submedian, thin, translucent, white. The nuclear whorls are about one and a-half, coiled helicoid and flattened, the succeeding sculpture radials begin, faintly at first, strengthening rapidly, about thirty increasing by intercalation to about sixty at the margin; the ribs are sharp, elevated, narrow with wide interspaces which are very finely concentrically striate, only seen with a good lens; margin smooth, thick, not crenulated by the ribs. Length 10 mm.; breadth 8·5 mm.; height 5 mm.

Is apparently related to *P. lavicostalis* Thiele (op. cit., p. 31, pl. 5, figs. 7, 8), described from unknown locality, but is closer ribbed and ribs narrower.

Collisellina bellatula sp. nov.

(Plate XXXI, fig. 13.)

A small *Patelloida* was found among the shell-drift at Michaelmas Cay, North Queensland, and later found alive on dead clamshells. In the Australian Museum I find the same species (unnamed) from Kawieng, New Ireland, but the species seems hitherto to have been overlooked.

Shell elliptical, depressed, apex anterior, regularly ribbed, ribs twelve in number, rarely additional ones are developed, edge of shell uneven, strongly crenulate. Colour white, radially lined with brown, obscured in life by coralline growth, inside white, spatula marked with pale brown. Ribs smooth save for growth-lines. Length 14 mm.; breadth 9·5 mm.; height 4 mm. (type): largest specimen 19 x 14 x 6 mm.

Habitat: North Queensland (on the Great Barrier Reef).

I do not know any species that needs comparison. On the reef the form of *Collisellina* I discussed in the Proc. Zool. Soc. (Lond.) 1914, p. 670, was rarely met with but many specimens have been seen, and it must now be named. On account of further knowledge it is here specifically named as *Collisellina paropsis* sp. nov., the type being selected from Michaelmas Cay, a dead shell measuring 30 mm. in length, 23 mm. in breadth, and 9 mm. high. Much larger

specimens occur up to 40 x 35 x 18 mm. The primary ribs number nine, secondary ones intercalating but never numbering many; anteriorly the species is narrowed with three prominent ribs, posteriorly broadening with four stronger ribs, one on each side between these two series being slightly weaker; the ribs are elevated, sharply angular, white; the interspaces marked with black angulate patches; the margin is strongly cut by these ribs. Inside the shell is white, the edge darker, the spatula pale brown speckled with dark-brown spots, a blue tinge often present. The same species appears to occur on New Caledonia, but the Philippine Island *saccharina* is easily separated by its shape, being seven-ribbed, the sides almost parallel. Quoy and Gaimard's *stellaris* is nearer, but it lacks the narrowing of the Australian shell. I am now using Dall's name *Collisellina* (Amer. Journ. Conch., vol. vi, p. 254. 1871) introdueed for this group alone as tending to more exaetitude in differentiating these difficult species.

Penepatella inquisitor gen. & sp. nov.

(Plate XXXI, figs. 17, 18.)

When I proposed *Patellanax* (Proc. Linn. Soc. N.S.W., vol. xlix, pp. 183, 239, Oct. 24, 1924) with *P. squamifera* Reeve as type, I had in view the series of tropical shells now to be treated. I mentioned the series in the British Museum of *cretacea* Reeve, *P. pentagona* (Born) Reeve, *P. stellaformis* Reeve, and *P. pica* Reeve. The specimens mentioned came from Tahiti, Society Group (*gigantea* Lesson), Elizabeth I. and Palmerston I. Representing these localities there are in this Museum many specimens from the Paumotu Islands, which are of course *paumotensis* Gould (Proc. Bost. Soc. Nat. Hist., ii, 150, 1846) and agree well with his figure. Specimens from Samoa agree better with Reeve's *pica* but lack the colouring. Unfortunately there are not shells from Vanikoro to confirm *flexuosa* Quoy and Gaimard, but the figure is sufficient to establish it as a member of this series. A very fine species comes from New Caledonia, very flattened, with nine very pronounced broad ribs and a rich orange spatula, which may be called *intraurea* sp. nov.

The Queensland shell may be now described thus:—Shell star-shaped, flattened, apex submedian, seven primary ribs, three anterior and four posterior. The primary ribs have many intercalating ones, rarely one becoming as important as the primary seven, the edge being coarsely denticulate in agreement with the ribs. Colour greenish white, sometimes with a few scattered black spots; inside shining greenish white, spatula indistinct. Length 33 mm.; breadth 30 mm.; height 8 mm.

A smaller elevated form, which may be called *arrecta* (Plate XXXI, figs. 21, 22) is easily separated; in this the primary ribs have become obsolete at a very early age and the edges less crenulate, the ribs much finer. Length 16 mm.; breadth 15 mm.; height 11 mm.; largest 24 x 21 x 12 mm.

This species was found living on clamshells at Michaelmas Cay, North Queensland, the depressed larger form on the outside, usually obscured by coralline growth, the taller smaller form inside the shells. The genus is geographically separated from *Patellanax*, which ranges from New South Wales southward to Tasmania, while the genus *Penepatella* lives on the coral reefs of Queensland and the South Pacific Ocean.

It is even possible that there are two series represented in the mid-Pacific, as while the present species, the New Caledonian, the Vanikoro, and the Elizabeth Island shells, are all small and superficially similar, there is the *pica* series, *cretacea-gigantea*, *paumotensis*, and apparently *kermadecensis*, which are more agreeable with each other in their larger size and anterior narrowing; and in support of this I find Powell describe *Scutellastra tucopiana* (Proc. Malac. Soc. (Lond.) vol. xvi, p. 169, fig. in text, 1925) from the island of Tucopia, a large shell measuring 92 x 73 x 25 mm.

In Hedley's Queensland list there appears *Acmaea costata* Sowerby; this must be expunged as I find the record is based upon the shell here above described. The southern *Patelloida alticostata* Angas probably occurs in South Queensland, as other Sydney forms in this genus range that far north. I have recorded *Patelloida petterdi* Ten.-Woods from Caloundra, and now add *Patelloida submarmorata* Pilsbry, while I have collected other species belonging to this family at Port Douglas, North Queensland, &c., which appear to be undescribed. There is also another limpet living on the coastal littoral of North Queensland which needs study.

Tenpetasus liberatus Pease.

Hedley recorded *Capulus intortus* Lamarck from Funafuti, Paumotus, Lifu, Norfolk Island, New Hebrides, and Geraldton, West Australia, and later in the West Australian list (Journ. Roy. Soc. W.A., vol. i, 1915, p. 189) is included the same name citing Pease, Am. Journ. Conch., iii, 284, 1867, in confirmation. Years ago I received the species catalogued from Norfolk Island, and investigated its nomenclature. It was a difficult task, as many of these limpet-like molluscs are superficially similar though their relationship may be distant. However, I found that Lamarck's species was West Indian, it probably had two or three earlier specific names, a generic name *Krebsia* Morch, and that it was certainly neither conspecific nor congeneric with the Pacific form. At the reference to Pease above noted, *Capulus liberatus* was described and figured (pl. 24, f. 2) from the Paumotus, the date of publication being April 2, 1868. This name can be used at present for the shell common at Norfolk Island, and which I collected at Michaelmas Cay, North Queensland, the first record for this State. The type of *Capulus* is *hungaricus* L., whose nepionic stage consists of a regularly coiled smooth helicoid of one and a-half whorls succeeded by a varix, quite unlike the Rissoid nucleus of the Pacific *liberatus*, for which I propose the new generic name *Tenpetasus*.

Hedley had listed in the Queensland catalogue two species as *Capulus*, *calyptra* Martyn and *tricarinata* L. The latter has a generic name, *Amathina* Gray (Proc. Zool. Soc. (Lond.) 1847, p. 157; ex Synops. Contents Brit. Mus., ed. 44, 63, 1842; cf. Iredale, Proc. Malac. Soc. (Lond.) vol. x, p. 302, 1913), and this should be used. The former has again little to do with the true *Capulus*, and it would be best to use a new genus name *Capulonix* for it at once.

The species listed as *Hipponix* by Hedley need similar treatment: the species regarded as *conica* may need description, but there is a genus *Sabia* Gray available for *conica*; the curious species called *barbata* Sowerby 1835 appears to have an older name *Pileopsis pilosus* Deshayes (Mag. de Zool., 2 Jr., Class V, Moll., pl. 9, Dec. 1831), and as it is obviously not congeneric either with *Sabia* or *Hipponix* I here introduce a new genus *Pilosabia* for the Australian form of *P. pilosus* Deshayes.

Family CERITHIIDÆ.

Here again difficulty is apparent in every direction, generic values being still undefined and specific identities masked in synonymic lumping. It will be a somewhat difficult task to unravel even the major groups, as there is no unanimous conclusion as to the type of *Cerithium*. At the present time it should be noted that there appears in Hedley's Queensland list many specific names which have no legal status. Thus *Cerithium contractum* Sowerby 1855 is included, but Bayle (Journ. de Conch., xxviii, p. 243, 1880) had provided *C. crumena* as Sowerby's name was invalid; at the same time Bayle (p. 246) added *C. proditum* for *Cerithium fusiforme* Sowerby 1855, also invalid. Through Sherborn's Index Animalium, pt. ii, I find many more, and here propose substitutes until revision can be thoroughly undertaken. *Cerithium duffieldi* nom. nov. for *Cerithium granosum* Kiener 1842, not *C. granosum* Borson (Mem. R. Acc. Sci. Torino, xxvi, 327, 1822). The well-known name *Cerithium lemniscatum* Quoy & Gaimard 1834 was anticipated by Brogniart (Mem. terr. Vicentin, p. 71, 1823), and I here propose *Cerithium problecma* nom. nov. for Quoy and Gaimard's species. *Cerithium marus* Lamarck 1822 is not the species so called by Brugnière in 1791, and the typical form of Lamarck's species is here renamed *Clypeomorus penthusarus* nom. nov.; there are many synonyms often cited but these appear to refer to different valid species. *Cerithium mitraforme* Sowerby 1855 is invalid if the genus name is broadly used, as Wood's *Murex mitriformis* 1828 was allotted to *Cerithium* by Wood himself in the same work. The species must be renamed if generic values be revised, but at present the names do not clash, Wood's *Murex mitriformis* being a *Clava*. *Cerithium variegatum* Quoy & Gaimard 1834 is invalidated, and differs from *janetlei* Hombr. and Jacquinot 1853, and I rename Quoy and Gaimard's species *Cerithium sejunctum* nom. nov. Again many names have been synonymised, but without much justification, from the series examined. *Cerithidea kieneri* Hombr. & Jacq. 1853, described as *Cerithium*, is here renamed *Cerithidea anticipata* nom. nov., as there is a prior *C. kieneri* Cantraine (Bull. Ac. Roy. Brux. ii, p. 392, 1835).

I was going to add *Cerithium lacteum* Kiener (Spec. Coquilles (Cerithium), p. 58, pl. vii, f. 3-3*a*, 1842), but I find there is a prior *C. lacteum* Philippi (Enum. Moll. Siciliae, vol. i, p. 195, 1836), so instead will add *Cerithium collacteum* nom. nov. for Kiener's species.

Two other names must be amended, viz., *Cerithium taniatum* Sowerby (Conch. Icon., vol. xv, sp. 119, 1865), which is invalid through the usage of the same name by Quoy and Gaimard in 1834, and I propose *Cerithium complexum* nom. nov. for Sowerby's species. I note it has been synonymised, but I have found that the species are much more distinct in nature than they appear in literature, and have seen half a dozen distinct species grouped under one name.

A better alteration I make in proposing *Cerithium phylarchus* nom. nov. for *Cerithium sowerbyi* Kiener (Spec. Coquilles Viv., Canal, p. 18, pl. vii, f. 2, 1841), which is not *C. sowerbyi* Deshayes 1834. This is a very fine species, quite distinct from *C. cumingi* A. Adams, with which it has been confused. I have not yet solved the problems surrounding the usage of the genus name *Cerithium*.

Family JANTHINIDÆ.

In Hedley's list only *Ianthina ianthina* Linné appeared. Some years ago I prepared a monographic account of these shells which still remains in manu-

script. I found, unfortunately, that many of the Australian forms needed discrimination and nomination, but here use the conventional terms only. Mr. C. Nicholson looked out for these molluscs for me at Caloundra, and I am able to add two species to the Queensland list, viz., *Iodina nitida* A. Adams (Proc. Zool. Soc. (Lond.) 1868, p. 620, 1869: from 23 deg. N. 152 deg. W. to off Tahiti, Pacific Ocean) and *Violetta globosa* Swainson (Zool. Illus., vol. ii, pl. 85, 1826). The new genus name *Violetta* is introduced with *globosa* as type, as this kind of Violet Snail differs very considerably from both *Janthina* and *Iodina*.

For the *Recluzia* Hedley used the specific name *johnii* Chemnitz; this has been demurred to, and it will be undoubtedly better to use *R. hargravesi* Cox (Proc. Zool. Soc. (Lond.), p. 172, pl. 16, f. 8, 1870) given to a New South Wales form. In the N.S.W. list Hedley preferred *lutea* Bennett, a name given to a tropical mid-Pacific form.

Family NATICIDÆ.

The variety of species in this family, and the difficulty in separating them without series, compelled their intensive collecting whenever met with, delightful results thereby accruing. While more species will be added to the Queensland list when all the material is worked out, three may here be introduced:—(1) *Natica gaidei* Souverbie (Journ. de Conch., vol. xxii, p. 196, pl. vii, fig. 7, April 1, 1874: Lifu), which is a synonym of *Natica lineozona* Jousseaume (Rev. Mag. Zool., ser. 3, vol. ii, p. 22, pl. ii, f. 3-4, 1874 (before April): hab. unknown) and *Natica notata* Sowerby (Thes. Conch., vol. v, p. 83, sp. 44, pl. 462, f. 168, 1883: New Caledonia). The operculum is sulcate and thus it falls into *Natica* s. str. (2) *Natica arachnoidea* Gmelin (Syst. Nat., pt. vi, p. 3674, 1791, for Chemn. 5, p. 271, pl. 188, f. 1915, 1916: locality unknown) was found alive with a notable brown velvety periostracum suggesting a distinct genus.

When Hedley wrote upon "Some Naticoids from Queensland" (Rec. Austr. Mus., xiv, pp. 154-162, 1924) he utilised *Uber* for the *mammilla* series with horny operculum, but indicated that groups could be utilised, observing: "Those species associated with *U. pes-elephantis*, being large massive shells with a wide umbilicus containing a stout spiral funicle, may be grouped under *Mammillaria* Swainson." *Mamillaria* was written by Swainson (Treat. Malac., p. 345, 1840), and *M. lactea* Sw. for Mart. 189, f. 1922, 1923, and this name was equal to *Natica alba* Gray 1827, and *N. pes-elephantis* Deshayes 1838, the last-named being preferred by Hedley, who included the species in the Queensland fauna on Schmeltz's record of a shell from Port Denison. It is pleasing, then, to report that Mr. Melbourne Ward collected a specimen on the beach at Friday Island, Torres Straits. Apparently the correct name to be used will be *Mamillaria alba* Gray, as the superficies is very different from that of the true *mammilla* series. In the case of *Mammilla* Schumacher, the species show a very large animal not retractile into the shell as is the animal of *pyriformis* Recluz and *flemingianum* Reeluz, two typical white "Eggshell Nerites" of the ancient writers.

Gennæosinum peleum gen. & sp. nov.

(Plate XXXI, fig. 12.)

This very distinct form can be shortly described as a finely sculptured *Natica* or a Naticoid style of "*Sigaretus*."

Shell globose, spire short, somewhat flattened, whorls rather rapidly increasing and descending, umbilicated, mouth lunate, edge sharp. Colour pure white, rather glossy, with three concentric rows of yellow markings sometimes spots, sometimes lines, and sometimes broad V-like markings along the periphery. Sculpture consists of close-set flattened liræ with narrow interstices, on the last whorl, twelve above and about twenty below the rounded periphery, mostly broad liræ above and mostly narrow below; on the antepenultimate and preceding whorls nine liræ are counted. Umbilicus large, open, perspective, funicle running up. Columella straight, a little flattened and recurved anteriorly, medially flattened forming a tooth-like projection from which a funicular rib runs into the umbilicus; above spreading as a glaze on the body whorl and crossing to posterior angle of mouth which is half-moon shaped. Height 14 mm.; width 17 mm.

Habitat: Michaelmas Cay, North Queensland.

Septa rubecula Linné.

While adding a species and genus to the Queensland and Australian fauna, this species is of more than ordinary interest. The genus *Septa* was introduced by Perry (Arcana, pl. ii., Jan. 1, 1810) with the sole species *Septa scarlatina*, which is the same as *Murex rubecula* Linné (Syst. Nat., xth ed., p. 749, 1758).

The name *Septa*, as used in Hedley's Queensland list, has been shown to need replacement by *Charonia* Gistel (Iredale, Nautilus, 1913, p. 55), so that this reintroduction is pleasing to me. I found the species at Michaelmas Cay, and Mr. Melbourne Ward at the Capricorn Group. The names in the family Cymatiidæ need much rearrangement, as many generic types are grouped under the name *Cymatium*. *Cymatium labiosum* Wood needs elimination as it refers to the same thing as *strangei* A. Adams and Angas, and, though I once advocated the identity of these two, the latter name should be used for the Australian shell.

Distorsio anus Linné.

This well-known species has not hitherto been recorded from Australia, as Shirley's report from "Burketown" is valueless. A series of shells received by Shirley from Burketown, an inland locality, comprised such Pacific species as *Harpa nobilis* Martyn, *Cypræa onyx* L., *Conus bullatus* L., *Conus luteus* L., &c., and were obviously never collected there, nor in Queensland. At the same time Shirley added "*Distortrix cancellatus* Desh., Yeppoon," but there was no such species named by Deshayes, and "*cancellinus*" was probably intended, but the author of that name was not even Deshayes. Furthermore, Hedley had included *Distortrix decipiens* Reeve, which would refer to the same species Shirley had in view. The correct name for this seems to be *Distorsio reticulata* Bolten (Mus. Bolten, ii, p. 133, 1798, based on Mart. 2, t. 41, f. 405, 406) from the Island of Hitoe in the Moluccas.

Family CONIDÆ.

Many more species of Cones exist in the Queensland seas than are listed at present, and I can add eleven, while I have another half dozen which have not yet been satisfactorily located.

Conus pulicarius Bruguière, Ency. Meth., Vers., vol. i, 1792, p. 622: Isles de l'Ocean Pacifique.

Conus catus Bruguière, Ency. Meth., Vers., vol. i, 1792, p. 707: I. St. Domingo, Martinique, and even Isle de France.

Conus eburneus Bruguière, Ency. Meth., Vers., vol. i, 1792, p. 640: Mers des Indes orientales.

Conus rattus Bruguière, Ency. Meth., Vers., vol. i, 1792, p. 700: Mers d'Amerique.

Conus miles Linné, Syst. Nat., xth ed., p. 713, 1758: in India: only reference is Rumph. mus. t. 33, f. W. = Amboina.

Conus omaria Bruguière, Ency. Meth., Vers., vol. i, 1792, p. 743; l'Ocean Asiatique, Madagascar, Manille.

Conus tulipa Linné, Syst. Nat., xth ed., p. 717, 1758: no locality given: 1st reference is Rumph. mus. t. 34, f. K, L = Amboina.

Conus vexillum Gmelin, Syst. Nat., pt. vi, p. 3397, 1791: habitat not given: 1st reference is Rumph. mus. t. 31, f. 3 = Amboina.

Conus virgo Linné, Syst. Nat., xth ed., p. 713, 1758: no locality given: 1st reference to Rumph. mus. t. 31, f. E = Amboina.

Included in Hedley's list are two species whose names need emendation: *Conus cinctus* Swainson (Zool. Illus., ser. i, pl. 110, July 1822) is invalid, through prior usage by Bosc 1801 (Buffon, ed. Deterville, Moll. v, p. 140) and Borson 1820 (Mem. R. Acc. Sci. Torino, xxv, p. 192), and is here renamed *Conus circumactus* nom. nov. The other one is *Conus deshayesii* Reeve (Proc. Zool. Soc. (Lond.) 1843, p. 168, June 1844), which is later than the proposition of the same name by Bellardi and Michelotti (Mem. R. Acc. Sci. Torino, ser. 2, vol. iii, p. 153, 1841), and has been corrected to *Conus cuvieri* by Crosse in a tract "Obs. genre Conus 12." which was issued in the Rev. Zool. 1858, but thus appears in Tryon (Man. Conch., vol. vi, pp. 87, 103, 1884).

Conus planorbis Born.

This well-known species has not hitherto been recorded from Queensland and Australia, and the original reference reads *Conus planorbis* Born. Index Mus., Vindob., p. 147, 1778, but this needs rectification. Though this index has a title-page dated 1778, this appears to have been prepared and never altered when the work was not concluded in time. The folio work known as the "Mus. Caes. Vindob." is entitled 1780, and is usually quoted as later than the index. Examination shows that they were simultaneously prepared as each quotes the other; and in the "Explicatio citationum abbreviatum" given in the index appears "Mus. Caes. Vindob. . . . Wien 1779, fol." Throughout the index the fourth volume of Martini's "Konch. Kab." is correctly cited, but that volume was not published until 1780, which proves conclusively that the index did not appear before that year. In view of this it would be best to quote the folio work, as in that place illustrations accompany the descriptions.

Conus litteratus L. **v. millepunctatus** Lamk.

Thus Hedley wrote in the Queensland list, but many workers have allowed the species as distinct. When Lamarck (Hist. Anim. s. Vert., vii, 461, 1822)

introduced his species *Conus millepunctatus*, he cited as illustrative "Martini, Conch. 2, t. 60, f. 666" and "Martini, Conch. 2, t. 60, f. 667," the former being his "var. b," the latter "var. c." These are apparently conspecific, and had been given systematic names by Bolten (Mus. Bolten, ii, p. 41, 1798) long before. Bolten had also (p. 47) introduced *Cucullus millepunctatus* for a different species of Cone, so it is doubly necessary to make use of Bolten's earlier name for the accepted *millepunctatus* Lam. The name to be used is *pardus*, as *Cucullus pardus* takes precedence over *Cucullus leopardus*, the former given to Martini's f. 667, the latter to f. 666.

Conus vermiculatus Lam.

This well-known species does not appear in Hedley's list, as it was regarded as merely a variety of *ebræus* Linné. I found it at the Kermadecs, but I did not receive it from Lord Howe Island, where *ebræus* was very common, until recently, when it came as a rare shell and was easily distinguishable. I found it at Michaelmas Cay along with *ebræus*, when it was easily seen to be a distinct species, the shape, size, and markings differing. The oldest name for the species is *chaldæus*, as Bolten had introduced *Cucullus chaldæus* (p. 42, 1798) for Martini, 2, t. 63, f. 699-700, the same figures as were later quoted by Lamarck for his species. It may be pointed out that this correction was made as long ago as 1852 (Mörch, Cat. Conch., Yoldi, p. 66) but has been ignored.

Terebra pygmæa Hinds.

A curious little shell was described by Hinds under this name (Proc. Zool. Soc. (Lond.) 1843, p. 158, 1844: from Straits of Malacca 17 F.), and though it was figured twice (Thes. Conch., i, p. 184, pl. xlv, f. 112, 1844; Reeve, Conch. Icon., vol. xii, pl. xxvii, sp. and f. 149, June 1860) the generic location was so peculiar that it was no wonder that it was redescribed as *Turbonilla ? princeps* Preston (Journ. Malac., vol. xii, p. 7, pl. ii, f. 33, April 7, 1905) from Ceylon. The recognition of this species from Michaelmas Cay provides the opportunity to give it a genus name, *Terenolla*.

This genus does not appear to belong even to the family Terebridæ, to which must be added some more species for Queensland, but it is difficult to determine the generic names to be used. A specific case is worthy of note, as *Terebra tigrina* Gmelin has been used for a shell which I collected at Michaelmas Cay, and was not on the list. Upon referring back I found that Gmelin (Syst. Nat., pt. vi, pp. 3475 and 3502, 1791) had used the name *Buccinum tigrinum* twice, and the reference to the *Terebra* was the second one, which was of course unavailable. The error had been corrected by Dillwyn (Descr. Cat., p. 644, 1817) more than a century ago, who had provided *B. felinum*, yet no worker had taken cognisance of the correction. The species would apparently fall into Dall's genus *Oxymeris*, but a careful study is necessary to fix the genera in this family, previous attempts having used mechanical features only for this purpose with somewhat disastrous results.

Another species to be added under *Oxymeris* is *Terebra nebulosa* Sowerby (Tankerville Cat. App., p. xxv, 1824: no locality).

Under the genus *Perirhoe* Dall there can be added two species: *Terebra cingulifera* Lamarck, Hist. Anim. s. Vert., vol. vii, p. 289, August 1822, habitat unknown; *Terebra monile* Quoy & Gaimard, Voy. de l'Astrol., Zool., vol. ii, p. 467, 1833, locality unknown but probably Marianes or Carolines.

Under the genus *Hastula* H. & A. Adams two more species must be included: *Terebra cerithina* Lamarck, Hist. Anim. s. Vert., vol. vii, p. 288, August 1822, Timor; *Buccinum hastatum* Gmelin, Syst. Nat., pt. vi, p. 3502, 1791, no locality.

HARPA Humphrey.

This is the first authentic record, as though Shirley recorded no less than four species—viz., *H. conoidalis* Lam., Torres Straits; *H. minor* Martyn, Torres Straits; *H. nobilis* Martyn, Burketown; and *H. crassa* Mörch, Normanton—both his nomenclature and localities are valueless, two of the latter being inland localities and two of the names being incorrect.

Hedley (Nautilus, vol. xxv, pp. 65-66, 1911) gave some notes on the nomination, pointing out that *Harpa harpa* Linné = *nobilis* Lamarck (Martyn did not use it); *Harpa davidis* Bolten was earlier than *H. conoidalis* Lam., while *Harpa amouretta* Bolten was earlier than *H. minor* Lam. (again not Martyn).

The specimen I collected was juvenile and is regarded as belonging to *H. harpa* L. It may be recorded that when Melvill (Journ. Conch. xv, p. 25, 1916) wrote upon the subject of *Harpa* he carelessly allotted two species to the North of Australia without citing any evidence.

Voluta wisemani Brazier.

This species was described as *Voluta (Antica) wisemani* by Brazier (Proc. Zool. Soc. (Lond.) 1870, p. 108: Journ. de Conch, vol. xix, p. 78, pl. v, f. 1, Jan. 1, 1871) from the north-east coast of Australia. The figure was copied by Sowerby (Thes. Conch., vol. v, pl. 513 (Voluta pl. xiv), f. 139, 1887), who accepted the species. No further specimens coming to hand the species was later degraded, and does not appear in Hedley's Queensland list, though the type is preserved in the Australian Museum. It was therefore pleasing to find it living on Michaelmas Cay, and establishing its specific distinction, and consequent addition to the Queensland list. According to Hedley's conclusions it would belong to *Cymbiola*, but that decision needs reconsideration.

Another addition to be made is a true *Cymbiola* named by Gray *Voluta sophia* (Ann. Mag. Nat. Hist., vol. xviii, p. 431, Dec. 1846: Endeavour Sound, North Australia), and figured in Jukes' Voy. "Fly," vol. ii, p. 355, pl. 1, figs. 1, 2, 1847, where the corrected locality "Endeavour River" is given. This species does not occur in the Queensland list, and simultaneously Smith published a note on the allied species (Ann. Mag. Nat. Hist., ser. 8, vol. i, p. 96, 1909), where he gave as localities "Endeavour Straits and Port Essington, North Australia: Warrior Reef and Darnley Island (Petterd)." At the same time he showed that *piperita* was exactly the same as *norrissii* Gray, and regarded *C. macgillivrayi* Cox as a light form, and *C. ruckeri* Crosse as a highly coloured form of *norrissii*, of extralimital distribution only, and that *nivosa* Lamarck was confined to West Australia. Hedley's record of *nivosa* Lamarck from Queensland probably referred to *sophia*, and *nivosa* must be expunged from list, but the record of *ruckeri* Crosse appears to be good.

The irresponsible Shirley suggested the following additions:—"*Scaphella norrissi* Sow., Cape York, and var. *sophia* Brazier, Cape York, and *piperita*

Sow., Cardwell." If these were not misidentifications of the same species they might refer to alien specimens, but Mr. Mel. Ward brought in from Friday Island a typical specimen of *sophia*, and it may be recorded that the figure given by Tryon (Man. Conch., vol. iv., p. 87, pl. 25, f. 57, 1882) as *sophiæ* is not the real species.

Family CYPRÆIDÆ.

Many more species exist in Queensland waters than were listed by Hedley, and a dozen are here added. In this case no attempt to determine the generic divisions has been made, as to a great extent these will depend upon animal characters:—

Cypræa becki Gaskoin, Proc. Zool. Soc. (Lond.) 1835, p. 205; Reeve, Conch. Icon., vol. iii, pl. xxii, sp. 125, 1846.

Cypræa caurica var. oblongata Melville, Mem. Proc. Manch. Lit. Soc., ser. ix. vol. i, p. 217, pl. 1, f. 8, 1888.

Cypræa cicercula Linné, Syst. Nat., xth ed., p. 725, 1758: "M. Mediterraneo."

Cypræa cribraria Linné, Syst. Nat. xth ed., p. 723, 1758: no locality cited.

Cypræa contaminata Sowerby, Conch. Illus., f. 21, p. 10, 1832: no loc. Ex. Gray MS.

Cypræa gaskoini Reeve, Proc. Zool. Soc. (Lond.) 1846, p. 23: Conch. Icon., vol. iii, pl. xxii, sp. 122, Feb. 1846.

Cypræa globulus Linné, Syst. Nat., xth ed., p. 725, 1758: "Asia," ex Rumph.

Cypræa irrorata Gray, Zool. Journ., vol. iv. p. 80, 1828: Reeve, Conch. Icon., vol. iii, sp. 126, Feb. 1846.

Cypræa mappa Linné, Syst. Nat., xth ed., p. 718, 1758: "O. Africæ."

Cypræa microdon Gray, Zool. Journ., vol. iv. p. 71, 1828: Reeve, Conch. Icon., vol. iii, sp. 139, Feb. 1846.

Cypræa nucleus Linné, Syst. Nat., xth ed., p. 724, 1758: "O. Indiæ or" ex Rumph.

Cypræa subcylindrica Sowerby, Thes. Conch., vol. iv. p. 9, pl. xxvii, f. 269, 1870: Indian Ocean, &c.

Cypræa talpa Linné, Syst. Nat., xth ed., p. 720, 1758: "Asia," ex Rumph.

Cypræa pyriformis Gray, Zool. Journ., vol. i, p. 371, 1824: Sowerby, Conch. Illus., f. 23, p. 7, 1832: Ceylon. Albany Passage, Mel. Wardi, Michaelmas Cay.

Some of these have already been recorded by Shirley, but his records are valueless, as extra-limital species from inland localities were included.

Cypræa staphylæa and limacina.

There has been much discussion as to the status of these two. Mr. Mel. Ward collected a series on the Capricorn Group and there prove to be two

distinct entities known under these two names in Queensland, whatever else may be the case. The larger form (*limacina*) is smooth with large spotting and pustules evanescent on the back, the median line being more or less ill-defined; the smaller shell (*staphylæa*) has strong pustulation, the groove on the back deep and very notable; the face, however, separates the shells easily, as in the small species the teeth extend right across the base, whereas the large shell has the teeth confined to the edges of the aperture, a white callus developing laterally on both sides; the teeth appear to number one or two more in the smaller species with more intercalating rugæ; the base, moreover, is entirely brownish red, while on the large species it is white, the teeth brown, the intervals between the teeth cream. I found the small species on Michaelmas Cay and Low Island only, the animal being black, dotted with white. Garrett says the animal of *limacina* is vermilion.

Xenuroturris legitima gen. & sp. nov.

(Plate XXXI, figs. 3, 4.)

When Hedley published his Revision of the Australian Turridæ (Rec. Austr. Mus., vol. xiii, pp. 213-359, 1922) he commented (p. 217): "*T. spectabilis* and *T. garnonsi* Reeve form a pair differing in the length of the canal. Similar pairs are *T. tigrina* Lamk. and *T. abbreviata* Reeve; *T. marmorata* Lamk. and *T. cingulifera* Lamk." The former series have a long canal, the latter a short one, and by a peculiar coincidence none of the latter series had been reported from Australia when Hedley wrote. I was therefore delighted to meet with the present species washed up alive on the beach at Michaelmas Cay. It agrees with shells called *T. cingulifera* Lam., but does not agree with Lamarck's description, which was from unknown locality, and specimens so determined prove very different from Mauritius and Polynesia.

Shell large, awl-shaped, mouth small, canal short and broad, fasciole deep, distant from the suture, and followed by a strong ridge which is composed of three liræ. Colour creamy white thickly dotted with pale red-brown spots, the raised ridge being ornamented by darker regularly spaced blotches. Sculpture consists of fine concentric liræ; on the antepenultimate whorl half a dozen can be counted above the ridge and a dozen below, four being more prominent; the last whorl shows the same sculpture throughout, seven liræ predominating; longitudinal sculpture scarcely observable save with a good lens. Columella nearly straight; inner lip with a very thin glaze extending across the body whorl; outer lip rather straight from the suture to the fasciole then from below the fasciole sweeping forward, then recurring to short open canal. Length 57 mm.; breadth 18 mm. Much larger specimen measures 72 x 23 mm. The operculum is leaf-shaped, thick, horny, apex terminal; differing considerably from that of *Asthenotoma* as figured by Hedley (Rec. Austr. Mus., vol. xiii, pl. xlii, f. 4, 1922) and from that of *Turris*, described as *unguiculate*. The short canal obviously differentiates the group generically.

Family MITRIDÆ.

The most troublesome groups of mollusca to-day are those of the best known shells such as Cones, Cowries, Mitres, and "Tritons." Field observation indicates differences in species that recent cabinet lumpers have depreciated, though the earlier splitting conchologists had keenly separated them. It is now

an arduous task to dig out of synonymy the correct name for the species observed. Thus members of different families are lumped under *Mitra,* as was shown long ago by Troschel and more recently confirmed by Cooke from study of the radulæ, and it is a nerve-wracking prospect to disentangle the species. I found local variation as well as individual and probably sexual, yet nevertheless specific values seem easy to establish. The generic groups are somewhat more difficult, as probably many more names are necessary, but here I simply attempt to locate the species found at Michaelmas Cay, as these amounted to some twenty-five species.

The genus name *Mitra* was long used for the red-spotted Mitres as dating from Lamarck, but it was first validly introduced by Martyn (Univ. Conch., vol. i, pl. 19, 1784), and the species *tessellata* is taken as type, a different form from the conventional *Mitra* which must now be called *Mitraria* Rafinesque (Anal. Nat., p. 262, 1815; cf. Iredale, Pro. Mal. Soc. (Lond.) ix, p. 262, 1911). This name was overlooked by Dall (U.S. Nat. Mus. Bull. 90, p. 60, 1915) when he introduced *Papalaria* for the same group.

Callithea Swainson (Treat. Malac., pp. 130-320, 1840) was anticipated by Boisduval (Mag. de Zool., v, pl. 122, 1835), and the *stigmataria* group is easily recognised, so for this I propose *Pulchritima* gen. nov. The small sand-living Mitres grouped under "*exasperata-torulosa*" form a little compact series for which I propose the name *Arcnimitra*, naming *arenosa* Lamarck as type. The species generally lumped I found to be distinct entities in life, so have to add four to our list. The common species *Mitra scutulata* "Lamarck" must be called *Strigatella discolor* Bolten (Mus. Bolten, ii, 137, 1798, for Chemn. 10, t. 151, f. 1428, 1429), as there is a prior *M. scutulata* Martyn (Univ. Conch., iv, f. 129, 1786-7) earlier than Gmelin's *V. scutulata* (Syst. Nat., pt. vi, p. 3452, 1791).

In the same way the species known as *Mitra digitalis* Chemnitz or Dillwyn must bear the name *Chrysame imperialis* Bolten (Mus. Bolten, ii, 135, 1798, for Chemn. 10, t. 151, f. 1432, 1433) on the same basis, while Lamarck had named the species *Mitra millepora* (Ann. Mus. Paris, vol. xvii, p. 198, 1811) before Dillwyn (Cat. Descr. Shells, p. 559, 1817) legitimatised Chemnitz's non-binomial name.

A beautiful addition to the Queensland list is Martyn's *Mitra sphærulata* (Univ. Conch., vol. i, f. 21, 1784), which must be placed in the genus *Scabricola* Swainson (Treat. Malac., pp. 130-319, 1840). Under *Costellaria* Swainson (Treat. Malac. pp. 130-320, 1840) to be added are: *Mitra intertaniata* Sowerby (Thes. Conch., vol. iv, p. 35, pl. 361 (Mitra, pl. x), f. 154, 1874); *Mitra concentrica* Reeve (Conch. Icon., vol. ii (Mitra, pl. xvii), f. 128, Oct. 1844: I. Annaa); and *Mitra armiger* Reeve (id. ib., pl. xxxv, f. 288, March 1845).

In the genus *Arcnimitra*, in addition to *arenosa* Lam. must be added: *Mitra approximata* Pease, Proc. Zool. Soc. (Lond.) 1860, p. 146; *Mitra cadaverosa* Reeve, Conch. Icon., vol. ii, pl. xxi, f. 160, Nov. 1844; *Mitra torulosa* Lamarck, Ann. Mus. Paris, vol. xvii, p. 216, 217, 1811; *Arcnimitra michaelis* nom. nov., for *M. exasperata* Reeve Conch. Icon., vol. ii, pl. xxi, f. 162, 1844.

Another species of *Chrysame* H. & A. Adams (Gen. Rec. Moll., vol. i, p. 171, 1853) to be added is *Mitra tiarella* A. Adams (Proc. Zool. Soc. (Lond.) 1851, p. 133), as determined by British authorities dealing with Lifu shells. It is unfortunate that no reliance can be placed upon these identifications, the only ones many Austral students have, as the types were available to the London

workers, and it would have been very helpful had only necessary care been taken in comparisons.

Two more species have to be added under *Strigatella*, viz.: *Mitra litterata* Lamarck, Ann. Mus. Paris, vol. xvii, p. 220, 1811; *Mitra auriculoides* Reeve, Conch. Icon., vol. ii, pl. 28, f. 228, Jan. 1845. Another addition to be made is *Mitra puncticulata* Lamarck, Ann. Mus. Paris, vol. xvii, p. 198, 1811, a species which Tryon placed under *Mitra* restricted, that is *Mitraria* to-day, but it certainly is not a true "red-spotted Mitre."

There are some other small Mitres to be yet determined from Michaelmas Cay, but mention must be here made that an addition has been made by Melvill, who has described *Mitra* (*Costellaria*) *quasita* (Proc. Mal. Soc. (Lond.) vol. xvi, p. 219, pl. x, f. 4, July 1925) from North Queensland.

A curious kind of Mitroid shell appears in Hedley's list under the name *Cylindra crenulata* Gmelin. The species was not uncommon at Michaelmas Cay, but with it there was a slenderer species which appears to be unnamed. The genus *Cylindra* was introduced by Schumacher (Essai. nouv. Syst. test, pp. 71-236, 1817), and has been rejected on account of the prior *Cylinder* Montfort (Conch. Syst. ii, 390, 1810); this has been questioned, so it is delightful to record that Sherborn has indexed (Index Animalium ii, p. 1744) a prior *Cylindra* Illiger (Mag. f. Insekt. (Illiger) i. p. 303, 1802) which effectually settles all argument.

Fischer (Manuel de Conch., pt. vii, p. 614, June 30, 1884) provided *Cylindromitra* as a substitute, giving *crenulata* as the example. This can be used, as although there is an earlier *Dactylus* Humphrey (Mus. Calonn., p. 9, 1797) whose tautonymic type is *Voluta dactylus* Linn., the present form may not be congeneric.

Cylindromitra fastidiosa sp. nov.

(Plate XXXI, fig. 20.)

Shell elongate, mouth narrow, colour white. It can be best described by comparison with the well-known *crenulata*, but the Queensland form of that shell differs and may be named *C. crenulata toleranda* subsp. nov. (Plate XXXI, fig. 19). The new species is smaller, narrower, and more delicately formed with eight or nine plaits on the columella instead of six or seven; there are forty to fifty spirals instead of thirty, and on the antepenultimate whorl four rows can be counted instead of two; the subsutural row is finely crenulate instead of coarsely reticulate; the colouration seems to be constantly white, whereas *C. c. toleranda* is girdled with pale brownish-yellow blotches with a more open mouth. The type of *C. fastidiosa* is 13·5 mm. long by 5·25 mm. wide, while the immature specimen of *C. c. toleranda* figured measured 15·5 mm. by 6·5 mm., an adult of the latter species measuring 22·5 mm. by 11 mm.

Another species, *Mitra undulosa* Reeve (Conch. Icon., ii, sp. 193, 1844), described from the Philippines, was synonymised by Tryon with *crenulata*, but it is very distinct and has been sent from Broome, North-west Australia.

Shirley recorded "*Cylindra nucea* Meuschen from Bowen," and the species which should be called *Acuticylindra nucea* Gronow (Zoophyl. Gronov. Icon. Explic., pl. xviii, f. 11, 1781; no locality) can be admitted, as it occurs on the Capricorn Group, and differs so remarkably from *crenulata* and *dactylus* that I provide the new genus name *Acuticylindra* for it alone.

Ecmanis igneus Gmelin.

A strange shell was determined as *Buccinum igneum* Gmelin (Syst. Nat., pt. vi, p. 3494, 1791, based on Martini 4, t. 127, f. 1217: no loc.); on the same basis Bolten founded his *Triton buccinulum* (p. 125), while Reeve introduced *Buccinum pictum* (Conch. Icon., iii, pl. x, sp. & f. 74, Dec. 1846) for a Philippine shell, which he regarded as the same. It was obviously referable to a genus not hitherto represented in the Australian fauna, and it was found to have a name given to it alone. Thus Möller in the Isis 1832, col. 131, printed a list of mollusca prepared by Schmidt, and therein included a new genus *Proboscidea* for *Buccinum igneum* Lin. Gmelin's edition of Linné's Systema Naturæ was commonly simply cited as "Lin." As Schmidt's name was preoccupied, having been used by Bruguière (Ency. Meth., Vers. Int., p. 96, 1791) as long before as 1791, the substitute *Ecmanis* was provided by Gistel (Nat. Thierr. Schuleu, p. x, 1848).

A smaller relation is the shell listed by Hedley as *Pisania crenilarum* A. Adams, which belongs to the genus *Jeannea* Iredale.

Family FUSIDÆ.

This name was recently introduced to replace the Colubrariidæ, and in the Queensland list two species of Colubraria were included—viz., *antiquata* Hinds and *tessellata* Reeve. Two more of this style of shell have to be added, so that the names may be corrected as follows:—

Colubraria strepta Cossmann.

Triton distortum Schubert and Wagner, Conch. Cab. (Martini & Chemnitz), vol. xii, p. 138, pl. 231, ff. 4074, 4075: no locality.

Not *Triton distortum* Lamarck, Liste Expl. Ency. Meth., p. 4, 1816.

Triton tortuosus Reeve, Conch. Icon., vol. ii, pl. xvii, f. 74, June 1844: I. of Burias, Philippines.

Not *Triton tortuosus* Brocchi.

Tritonium streptum Cossmann, Essai Paléoconch. comp., 5th livr., p. 93, footnote Dec. 1903: new name for above.

This is the only species of *Colubraria* on the Queensland list, as *tessellata* Reeve above cited has already been corrected by Hedley to *Caducifer decapitatus* Reeve, and I here propose *Nivitrilon* gen. nov. for *Trilon antiquatus* Hinds. When Dall (Smithson Miscell. Coll. (qtly. issue), vol. 47, 1904) dealt with this group he allowed the last-named to belong to *Phrygiomurex*, proposed at the same time for *Triton sculptilis* Reeve, but I cannot see any close relationship. This genus and species must be added to the Queensland list.

Family NASSARIIDÆ.

The species included in this family need subdivision so that the species can be quickly located. The family has been accurst since Marrat "worked" at it, and came to the fatuous conclusion that probably all the forms of the world represented "*one species.*" This result is characteristic of the folly of lumping, as in nature the species are very well defined, and very easy to distinguish, while probably the groups will be as easily circumscribed, when thoroughly studied.

The species name *N. coronatus*, based on *Buccinum coronatum* Bruguière (Ency. Meth. Vers., i, 1792, p. 276) is untenable, as Martyn (Univ. Conch. iii, 1786-7, f. 83) had previously used it. Names of synonyms appear in monographs, but generally these show well-marked differences. There is, however, an even earlier name, *Buccinum fasciolatum* Gronow (Zorophyl. Gronov. 1781, Icon. Expl., p. v, for pl. xix, figs. 7-8), which appears to be an excellent illustration of the species I know.

The species name *crenulatum* must be corrected, as Linné had used this in the genus *Buccinum* before Bruguière introduced it for a species of *Nassarius*. A beautiful little shell from the New Hebrides was called *Nassa eximia* by H. Adams (Proc. Zool. Soc. (Lond.) 1872, p. 14, pl. 3, f. 28), and when I saw it from New Caledonia it seemed a very atypical *Nassa*, so when I collected it at Michaelmas Cay I determined to provide a new generic name, *Allanassa*, for it.

Two other species have to be added:—*Nassa callospira* A. Adams, Proc. Zool. Soc. (Lond.) 1857, p. 102, 1852: I. Burias; Reeve, Conch. Icon., viii, Nassa, pl. x, sp. & f. 66, 1853; *Niotha comtessei* Iredale, Austr. Zoologist, vol. v; p. 347, pl. xxxviii, f. 13, 1929.

"COLUMBELLID" SHELLS.

The genus name *Columbella* has been used for a heterogeneous series of shells, and restriction would have lessened its usage so much that its disappearance will not cause much heartburning. Bolten's name *Pyrene* has come into use for Australian species, while *Columbella* was left to the American species about *mercatoria* L., its monotype. However, *Pterygia* Bolten had not been scientifically eliminated, so, in order to preserve *Marginella*, Dall, by a curious method of working, fixed on *P. nucella* as type, and thus would have made *Pterygia* equal to and older than *Cylindromitra* Fischer. However, the third species in Bolten's list was *P. vulgaris*, and this species must be regarded as the type of Bolten's genus. Unfortunately this species is Linné's *V. mercatoria*, and consequently *Pterygia* would finally crush the claims of *Columbella* to recognition. This does not greatly concern us as the only species resembling the West Indian *mercatoria* have already been separated as *Euplica* by Dall. In the Queensland list already there are *varians* Sowerby and *versicolor* Sowerby as members of *Euplica*, and now I add two more: *Columbella deshayesii* Crosse, Journ. de Conch., vol. vii, p. 382, pl. xiv, f. 4, June 1859: Oceania?; *Columbella anceps* Hervier, Journ. de Conch., vol. xxxix, p. 309, 1899: Lifu.

A beautiful shell has been identified as *Colombella ligula* Duclos (Illustr. Conch. (Chenu), Mon. Col., pl. 11, f. 11-16, 1840), and for this species I propose the new genus *Graphicomassa*. Other species in the Queensland list will group with this.

Another handsome little shell appears in the Queensland list as *Pyrene cumingii* Reeve; since, Hedley transferred it to *Aesopus* and named a var. *queenslandica*. As a synonym of Reeve's species, Tryon (Man. Conch., vol. v, p. 151, 1883), among other names which do not seem pertinent, cited *Colombella spicula* Duclos (Illustr. Conch. (Chenu) Mon. Col., pl. 16, f. 9-10, 1847), which seems to be the same species and has many years' priority. For this species I introduce the new generic name *Laevesopus*, designating the Queensland form as type; this may be a distinct species, but at present there is not sufficient material to decide.

Transtrafer longmani gen. & sp. nov.

(Plate XXXI, figs. 10, 11.)

Shell broadly fusiform, spire short, less than aperture, canal short, surface malleated. Colour white, mouth edged with faded wine colour. Apical whorls one and a-half, elevated, brown, adult whorls five. Sculpture consists of longitudinal varicose ribs crossed by distant encircling beams which form square deep hollows; the shell is very thin in these hollows and translucent, whereas the beams are stout; the varices are delicately edged while forming but do not persist save at the aperture where a series develop fine frills. Columella smooth, the inner lip reflected leaving an umbilical chink. Aperture thickened, varicose, frill-edged, internally ten teeth. Canal short, narrow, open. Operculum purpuroid. Length 27 mm.; breadth 18 mm.

Collected on dead coral blocks at Michaelmas Cay. Since, Mr. Melbourne Ward has collected a fine series in the Albany Passage, some much larger measuring 37 x 25 mm. and having a reddish orange colour, the edges of aperture a deeper shade, interior white. This beautiful shell was first collected in North Queensland many years ago by Brazier, and then lately Hedley had found it, but it had not been recorded. It bears a striking resemblance to the American *Murex vitulinus* Lamarck, the type of *Vitularia* Swainson, and was placed in that genus in the Australian Museum collection. It is closely related to *Murex crenifer* Souverbie (Journ. de Conch., vol. ix, p. 279, pl. xi, figs. 9-10, July 1, 1861), described from Balade, New Caledonia, but in the Australian shell the lamella are more developed, and therefore the window-like depressions much more pronounced. The genus should be placed next to *Coralliophila*.

I have named the species for my friend Mr. Heber A. Longman, Director of the Queensland Museum, as a reminder of many favours.

Drupina grossularia Bolten.

Better known under the name *Sistrum digitatum* Lamarck, this curious and handsome coral-living form has not previously been recorded from Queensland and Australia. Previous to the one secured at Michaelmas Cay, Hedley had picked a dead shell up at Bramble Cay, at the end of 1924, one of the last additions he made to his beloved reef molluscan fauna.

Dall gave some Notes on *Drupa* and *Morula* (Proc. Acad. Nat. Sci. Phil., vol. 75, pp. 303-306, 1923), and introduced *Drupina*, with type *Ricinula digitata* Lam., and *Morulina*, with type *R. mutica* Lam., using *Drupa* Bolten for the type *R. horrida* Lam., and *Morula* Schumacher for the series *R. morus* Lam. Dall overlooked Hedley's notes in the Nautilus (vol. xxvii, p. 79, 1913) and mine in the Proc. Mal. Soc. (Lond), vol. xiii, p. 38, 1918. Thus he determined *spathulifera* Blainville as the earliest name for the shell called *hystrix* by Kiener, and Tryon, but Hedley had already recorded *rubuscaesius* Bolten for that species; he considered *reeveana* Crosse as only a purple-mouthed variety of *spathulifera*, but Hedley had shown it was a distinct species that had been named *rubusidæus* by Bolten. He proposed the new name *Morula rhyssa* for *R. fiscellum* Reeve (Conch. Icon. Ricinula, pl. 4, fig. 28, 1846), but Hedley had already named that species *Thais crassulnata* (Proc. Linn. Soc. N.S.W., xxxix, 1914, p. 749, pl. lxxxv, f. 90, Feb. 26, 1915). Dall concluded that *nodus* Bory St Vincent 1816 was prior to *morus* Lamarck 1822 and *papillosa* Schumacher 1817. The author of *nodus* 1816 was Lamarck, not Bory St. Vincent, and I had shown that *uva* Bolten

referred to the same species and should be used. Pilsbry had demurred as he said the figure was a poor one, but overlooked the excellent description which defied any criticism. At the same time I drew attention to Marten's *Semiricinula* introduced for the *muricina* group, and I proposed *Muricodrupa* naming *fenestrata* as type. Neither of these was noted by Dall and he included *fenestrata* in his new group *Morulina*, and apparently would regard *muricina* as a member of *Morula*. As *mutica* may represent a different group from that of *fenestrata*, *Morulina* may be preserved. Dall's *Morulina ceylonica* "resembling *M. nodus* on a minute scale" recalls *ozenneana*, which would be better classed in *Morula* with *nodus* (=*uva*), the type of the latter group.

Many years ago Cooke (Cambridge Natural History, vol. iii, p. 222, fig. 124) figures the curious radula of *spectrum* Reeve, and when he dealt with the radulæ of this group (Proc. Mal. Soc. (Lond.), xiii, p. 106, 1919) he allowed the species in *Morula* without comment. Thiele (Wissen. Deutsche Tief—See Expd. "Valdivia," Bd. 17, heft 2, teil 2, p. 137 (171), figs. 3, 4, text, 1925), finding a similar radula in *siderea* Reeve, has proposed for these the new genus *Drupella*. Hedley regarded *spectrum* Reeve as the same as *elata* Blainville and determined both as *mancinella* Linné, under which name in the genus *Drupa* it appears in the Queensland list. Cooke recorded a normal radula of *Morula* under the name *elata* Blainville, which indicates confusion.

Coralliophila dorbignyana Petit.

Trichotropis dorbignyanum Petit, Journ. de Conch., ii, p. 261, pl. 7, f. 2, Nov. 15, 1851: Pacific Ocean.

Purpura orbignyana Petit, ib. v, p. 37, July 1856.

Purpura trichotropoides Souverbie, ib. ix, p. 284, July 1861: ex Montrouzier M.S.: New Caledonia.

This beautiful and distinct species was found at Michaelmas Cay, and it is amusing to read Tryon's conclusions: "is the latter form not yet adult," the latter form being *P. gibbosa* Reeve, which was classed as "a form with the scabrous revolving striæ well developed" of *C. neritoidea* Lam. = *violacea* Kiener. I should say that *gibbosa* was quite unlike Petit's shell, and the latter is nothing like *violacea*, which was also collected. Hedley has included Reeve's *squamulosa* in preference to *violacea*, but the specimens seem to agree better with the latter.

Family OBELISCIDÆ.

Under *Pyramidella* Hedley ranged a series of shells very easily divisible into two major groups. The genus name *Obeliscus* was introduced in 1797 by Humphrey (Mus. Calonn., p. 24) for Linné's *Trochus dolabratus*. Two years later Lamarck introduced *Pyramidella* for the same species, so that it cannot be preserved in any sense. A. Adams utilised the two for the different series now under notice, but Fischer (Man. Conch., 787, 1885) emended this, proposing *Otopleura* with *auris-cati* Chem. alone. Hedley's series can then be allotted thus:—*Otopleura* to cover *auris-cati*, *gracilis*, and *mitralis*; and *Obeliscus* for the rest—*acus concinnus*, *pulchellus*, *terebelloides*, *tessellatus*, and *turritus*.

Many specimens were collected at Michaelmas Cay and it was found that many species were represented, so that seven may now be added: *nitida*, *variegata*,

and *propinqua* to *Otopleura*, and *fastigium*, *sulcatus*, *teres*, and *monilis* to *Obeliscus*. All these were described by A. Adams in the Thes. Conch., vol. ii, as follows:—

Pyramidella nitida A. Adams, Thes. Conch., ii, p. 815, pl. clxxii, f. 11: Philippines.
Pyramidella variegata id. ib., p. 814, pl. clxxii, f. 10: I. Masbate, Philippines.
Pyramidella propinqua id. ib., p. 814, pl. clxxii, f. 8: Reetea, Society Islands.
Obeliscus fastigium id. ib., p. 809, pl. clxxi, f. 8: I. Bohol, Philippines.
Obeliscus sulcatus id. ib., p. 807, pl. clxxi, f. 34: Tahiti.
Obeliscus teres id. ib., p. 807, pl. clxxi, f. 31-32: I. Panay, Philippines.
Obeliscus monilis id. ib., p. 806, pl. clxxi, f. 12: I. Negros, Philippines.

These determinations may need amendment when series are available, but the names represent different entities and there are still more.

Dolabella auricularia Solander.

A well-known tropical slug has a curious degenerate shell and this was named *Patella auricularia* by Solander (Cat. Portland Mus., p. 154, 1786), Rumph's pl. 40, f. N, being cited as representative, the locality being given as Amboyna. A year or more later Martyn (Univ. Conch., vol. iii, fig. 99, 1787) gave an excellent figure, the name selected being *Patella scapula*, also from Amboyna. Under the name *Dolabella scapula* it appears in both the Queensland and New South Wales lists, and, while the former should be now called *Dolabella auricularia* Solander, the New South Wales species is very distinct in life though the shell shows little differentiation. In the southern form, which grows to a larger size, the posterior is not so abruptly cut off, nor is the rim edged with branching papillæ, nor are these so numerous or so long on the rest of the body. It will be fully described and figured at a later opportunity, but in order to save confusion it is here named *Dolabella andersoni* sp. nov., the type from Gunnamatta, Port Hacking.

QUEENSLAND LAND SHELLS.

I am preparing a Synonymic List of the Land Shells of Australia, and find that the large Queensland shells have generally local distribution, and that probably more forms will be recognised than have been recently listed. It is important, however, to have the exact locality before deciding as to the value of any difference, while series are absolutely essential. The present opportunity is taken to introduce a fine new species which I name—

Hadra mortenseni sp. nov.

(Plate XXXI, fig. 9.)

Shell helicoid, globose elevated, narrowly umbilicate. Colour of early whorls pale orange brown, broad bands of reddish brown developing and becoming deeper in colour, almost black-red just behind the aperture. On the antepenultimate whorl a subsutural line of greenish yellow is well defined, followed by a broad bank of dark red-brown, a narrow line of orange-red, another broader band of dark red-brown, a narrow line of orange-red, and then a broad presutural band of dark red-brown again. The last whorl shows the same colouring above the periphery, which is well rounded, but on the base three narrow lines of dark red-brown alternate with similar lines of orange, and these are succeeded by a

broad band of dark red-brown, then some more lines and round the umbilicus a broad dark band again; the colour is all massed into dark brown behind the outer lip which is well reflected but thin; inside of aperture deep shining lilac. There is superficially no sculpture, but under the microscope a very delicate longitudinal scratching can be discerned. The aperture is a little oblique, columella broad reflected over the umbilicus but leaving a chink. Height 48 mm.; greater diameter 46 mm.; less diameter 36 mm.

The figure of *Helix moresbyi* Angas (Proc. Zool. Soc. (Lond.) 1876, pl. xx, f. 8-9) from Port Denison is recalled at once, but our species has not the peculiarly flattened base of *moresbyi*, and belongs to a different series. It may be near *johnstonei* Brazier (Proc. Zool. Soc. (Lond.) 1875, p. 32, pl. 4, f. 2), which is not a synonym of *incei* as given by Fulton (Journ. Malac., vol. xi, p. 2, 1904) when he reviewed the group *Spharospira*.

Mr. A. Musgrave, of the Australian Museum, brought back a single dead shell of this fine species and was then instrumental in getting Mr. R. M. Mortensen, after whom this species is named, to collect a series and prove its validity.

For quick reference the new names proposed in this essay are here listed:—

Solemya terræregina n. sp.
Nuculana caloundra n. sp.
Imparilarca n. gen. with type *I. hubbardi* n. sp.
Barrimysia n. gen. with type *Rochefortia excellens* Hedley.
Fastimysia n. gen. with type *Rochefortia viastellata* Hedley.
Fragum symbolicum nom. nov. for *Cardium hystrix* Reeve.
Fragum perornatum nom. nov. for *Cardium imbricatum* Sowerby.
Fragum whitleyi n. sp.
Pardosinia n. gen. with type *P. colorata* n. sp.
Pardosinia alma n. sp.
Bonartemis n. gen. with type *B. stabilis* n. sp.
Heteroglypta hedleyi n. sp.
Heteroglypta avecta n. sp.
Heteroglypta pansa n. sp.
Heteroglypta saltatrix n. sp.
Quidnipagus n. gen. with type *Cochlea palatam* Martyn.
Jactellina n. gen. with type *Tellina bougei* Sowerby.
Salmacoma n. gen. with type *S. vappa* n. sp.
Tetemactra n. gen. with type *Mactra obesa* Reeve.
Colorimactra n. gen. with type *Mactra queenslandica* Smith.
Colorimactra florens n. sp.
Lutraria impedita nom. nov. for *Lutraria elongata* Gray.
Lutriomactra n. subgen. with type *Lutraria impedita* Iredale.
Standella hubbardi n. sp.
Meropesta n. gen. with type *M. meridiana* n. sp.
Pharella wardi n. sp.
Montfortia excentrica n. sp.
Montfortista n. subgen. with type *Montfortia excentrica* Iredale.
Sanhaliotis n. gen. with type *Haliotis varia* Linné.

Sanhaliotis varia aliena n. subsp.
Sanhaliotis howensis n. sp.
Sanhaliotis dissona n. sp.
Lætifautor n. gen. with type *Calliostoma trepidum* Hedley.
Catthalotia n. gen. with type *Calliostoma arruense* Watson.
Pulchrastele n. gen. with type *Astele septenarium* Melvill & Standen.
Conotalopia n. gen. with type *Minolia henniana* Melvill & Standen.
Parminolia n. gen. with type *Minolia agapeta* Melvill & Standen.
Vanitrochus n. gen. with type *Solariella tragema* Melvill & Standen.
Vaceuchelus n. gen. with type *Euchelus angulatus* Pease.
Senectus permundus nom. nov. for *Turbo concinnus* Philippi.
Senectus necnivosus nom. nov. for *Turbo nivosus* Reeve.
Senectus perspeciosus nom. nov. for *Turbo speciosus* Reeve.
Senectus trossulus nom nov. for *Turbo intercostalis* Philippi.
Dentarene n. gen. with type *D. sarcina* Iredale.
Dentarene sarcina nom. nov. for *Delphinula crenata* Kiener.
Dentarene munitus nom. nov. for *Delphinula muricata* Reeve.
Globarene n. gen. with type *Delphinula cidaris* Reeve.
Globarene cidaris lenullus n. subsp.
Cinnalepeta n. gen. with type *Patella cinnamomea* Gould.
Cinnalepeta vagans n. sp.
Cinnalepeta escensa n. sp.
Zacalantica n. gen. with type *Phenacotepas linguaviverra* Melvill & Standen.
Amapileus n. gen. with type *A. immeritus* n. sp.
Collisellina bellatula n. sp.
Collisellina pavopsis n. sp.
Penepatella n. gen. with type *P. inquisitor* n. sp.
Penepatella intraurea n. sp.
Penepatella arrecta n. sp.
Tenpetasus n. gen. with type *Capulus liberatus* Pease.
Capulonix n. gen. with type *Patella calyptra* Martyn.
Pilosabia n. gen. with type *Pilcopsis pilosus* Deshayes.
Cerithium duffieldi nom. nov. for *Cerithium granosum* Kiener.
Cerithium probleema nom. nov. for *Cerithium lemniscatum* Quoy & Gaimard.
Clypeomorus peuthusarus nom. nov. for *Cerithium morus* Lamarck.
Cerithium sejunctum nom. nov. for *Cerithium variegatum* Quoy & Gaimard.
Cerithidea anticipata nom. nov. for *Cerithium kieneri* Hombron & Jacquinot.
Cerithium collacteum nom. nov. for *Cerithium lacteum* Kiener.
Cerithium complexum nom. nov. for *Cerithium laniatum* Sowerby.
Cerithium phylarchus nom. nov. for *Cerithium sowerbyi* Kiener.
Violetta n. gen. for *Janthina globosa* Swainson.
Geunarosinum n. gen. with type *G. peleum* n. sp.
Conus circumactus nom. nov. for *Conus cinctus* Swainson.
Terenolla n. gen. for *Terebra pygmæa* Hinds.
Xenuroturris n. gen. with type *X. legitima* n. sp.
Pulchritima n. gen. with type *Mitra stigmataria* Gmelin.
Arcanimitra n. gen. with type *Mitra arcanosa* Lamarck.

Arenimitra michaelis nom. nov. for *Mitra exasperata* Reeve.
Cylindromitra fastidiosa n. sp.
Cylindromitra crenulata loleranda n. subsp.
Acuticylindra n. gen. with type *Voluta nucea* Gronow.
Viritriton n. gen. with type *Triton antiquatus* Hinds.
Allanassa n. gen. with type *Nassa eximia* H. Adams.
Graphicomassa n. gen. with type *Colombella ligula* Duclos.
Lavesopus gen. with type *Colombella spicula queenslandica* Hedley.
Transtrafer n. gen. with type *T. lougmani* n. sp.
Dolabella andersoni n. sp.
Hadra mortenseni n. sp.

The species to be added to the Queensland list in addition to the novelties may be here listed:—*Arca crebricostata* Reeve, *Jactellina obliquaria* Deshayes, *Jactellina balansa* Bertin, *Jactellina hungerfordi* Sowerby, *Obtellina bougei* Sowerby, *Obtellina obtusalis* Deshayes, *Sanhaliotis pustulifera* Pilsbry, *Sanhaliotis crebrisculpta* Sowerby, *Trochus obesus* Reeve, *Trochus crebrigranatus* Reeve, *Trochus fastigiatus* A. Adams, *Clanculus gatliffi* Tomlin, *Parminolia apicina* Gould, *Vanitrochus semiustus* Fischer, *Vanitrochus tragema* Melvill & Standen, *Vaccuchelus angulatus* Pease, *Lunella porcata* Reeve, *Calcar pileolum* Reeve, *Calcar stellare* Gmelin, *Calcar rotularia* Lamarck, *Leucorhynchia caledonica* Crosse, *Leucorhynchia tricarinata* Melvill & Standen, *Phenacolepas reticulata* Thiele, *Patelloida submarmorata* Pilsbry, *Tenpetasus liberatus* Pease, *Iodina nitida* A. Adams, *Violella globosa* Swainson, *Natica lineozona* Jouss., *Natica arachnoidea* Gmelin, *Sepia rubecula* Linné, *Distorsio anus* Linné, *Conus pulicarius* Bruguière, *Conus calus* Brugnière, *Conus eburneus* Bruguière, *Conus ratlus* Bruguière, *Conus miles* Linné, *Conus omaria* Bruguière, *Conus tulipa* Linné, *Conus verilhum* Gmelin, *Conus virgo* Linné, *Conus planorbis* Born, *Conus chaldaus* Bolten, *Oxymeris felina* Dillwyn. *Terenolla pygmaea* Hinds, *Oxymeris nebulosa* Sowerby, *Perirhoe cingulifera* Lamarck, *Perirhoe monilis* Quoy & Gaimard, *Hastula cerithina* Lamarck, *Hastula hastata* Gmelin, *Harpa harpa* Linné,*Cymbiola wisemani* Brazier, *Cymbiola sophia* Gray, *Cypræa becki* Gaskoin, *Cypræa caurica* var. *oblongata* Melvill, *Cypræa cicercula* Linné, *Cypræa cribraria* Linné, *Cypræa contaminata* Sowerby, *Cypræa gaskoini* Reeve, *Cypræa globulus* Linné, *Cypræa irrorata* Gray, *Cypræa mappa* Linné, *Cypræa microdon* Gray, *Cypræa nucleus* Linné, *Cypræa subcylindrica* Sowerby, *Cypræa talpa* Linné, *Cypræa pyriformis* Gray, *Scabricola sphærulata* Martyn, *Costellaria intertæniata* Sowerby, *Costellaria concentrica* Reeve, *Costellaria armiger* Reeve, *Arenimitra approximata* Pease, *Arenimitra cadaverosa* Reeve, *Arenimitra torulosa* Lamarck, *Chrysame tiarella* A. Adams, *Strigatella litterata* Lamarck, *Strigatella auriculoides* Reeve, *Mitraria puncticulata* Lamarck, *Costellaria quæsita* Melvill, *Acuticylindra nucea* Gronow, *Ecmanis igneus* Gmelin, *Colubraria strepta* Cossmann, *Phrygiomurex sculptilis* Reeve, *Allanassa eximia* H. Adams, *Nassarius callospira* A. Adams, *Niotha comtessei* Iredale, *Euplica deshayesii* Crosse, *Euplica anceps* Hervier, *Graphicomassa ligula* Duclos, *Drupina grossularia* Bolten, *Coralliophila dorbignyana* Petit, *Otopleura nitida* A. Adams, *Otopleura variegata* A. Adams, *Otopleura propinqua* A. Adams, *Obeliscus fastigium* A. Adams, *Obeliscus sulcatus* A. Adams, *Obeliscus teres* A. Adams, *Obeliscus monilis* A. Adams.

EXPLANATION OF PLATE XXX.

Figs. 1, 2.—*Imparilarca hubbardi* Iredale.
Figs. 3, 4.—*Bonartemis stabilis* Iredale.
Figs. 5, 6.—*Heteroglypta saltatrix* Iredale.
Figs. 7, 8.—*Salmacoma rappa* Iredale.
Figs. 9, 10.—*Pardosinia colorata* Iredale.
Figs. 11, 12.—*Standella hubbardi* Iredale.
Fig. 13.—*Solemya terræreginæ* Iredale.
Fig. 14.—*Fragum whitleyi* Iredale.
Figs. 15, 16.—*Pardosinia alma* Iredale.
Fig. 17.—*Nuculana caloundra* Iredale.

Queensland Mollusca.—Iredale.

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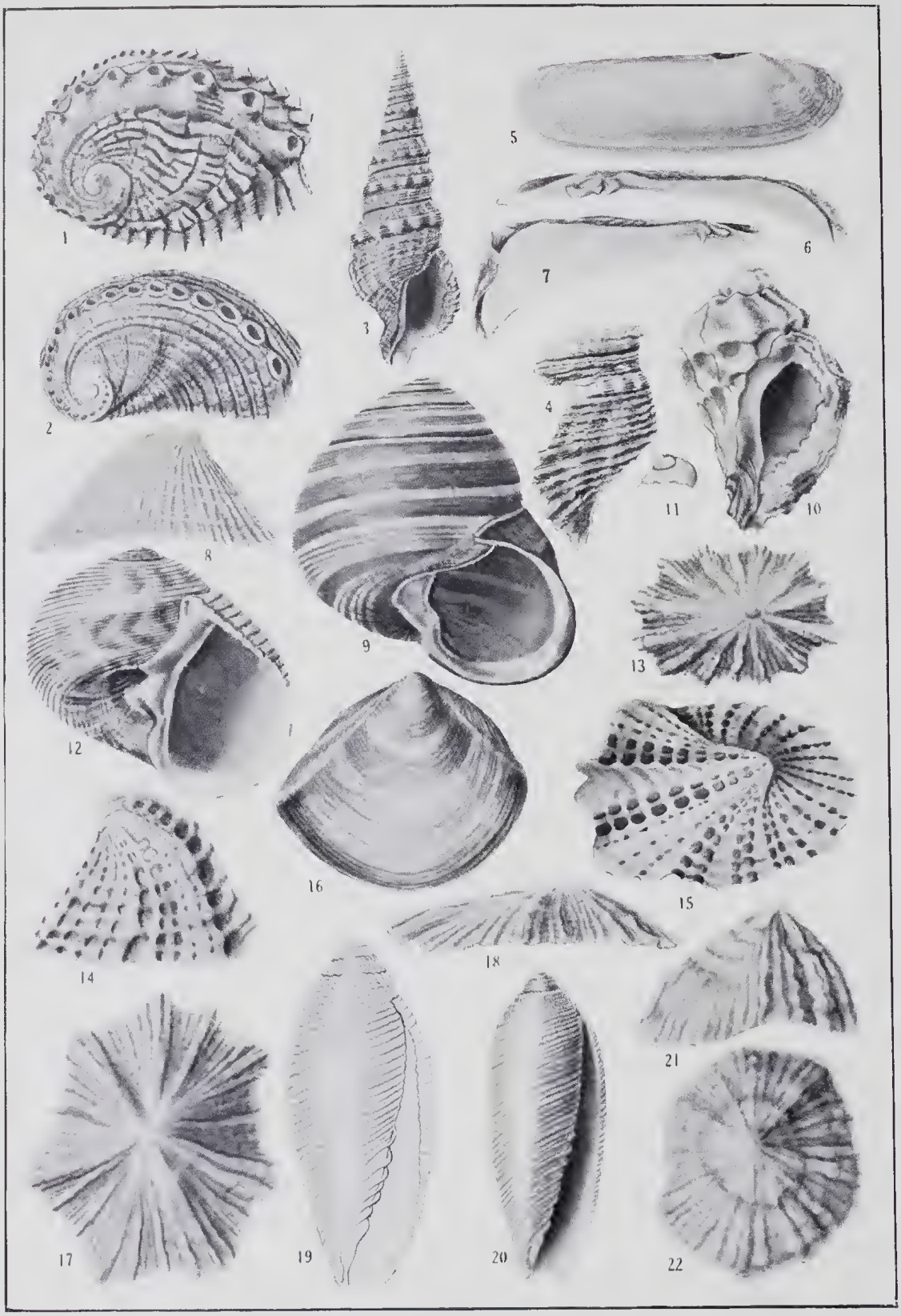


Queensland Mollusca.—Iredale.

EXPLANATION OF PLATE XXXI.

Fig. 1.—*Haliotis hanleyi* Ancey, Type.
Fig. 2.—*Sanhaliotis dissona* Iredale.
Figs. 3, 4.—*Xenuroturris legitima* Iredale.
Figs. 5, 6, 7.—*Pharella wardi* Iredale.
Fig. 8.—*Amapiteus immeritus* Iredale.
Fig. 9.—*Hadra mortenseni* Iredale.
Figs. 10, 11.—*Transtrafer longmani* Iredale.
Fig. 12.—*Gennæosinum peleum* Iredale.
Fig. 13.—*Patelloida bellatula* Iredale.
Figs. 14, 15.—*Montfortia excentrica* Iredale.
Fig. 16.—*Colorimactra florens* Iredale.
Figs. 17, 18.—*Penepatella inquisitor* Iredale.
Fig. 19.—*Cylindromitra crenulata tolerandа* Iredale.
Fig. 20.—*Cylindromitra fastidiosa* Iredale.
Figs. 21, 22.—*Penepatella arrecta* Iredale.

BEES IN THE QUEENSLAND MUSEUM.

By T. D. A. Cockerell.

Euryglossa aurescens obscura n. subsp.

Female. Length about 7·5 mm., with mesothorax, scutellum, and axillæ red, abdomen dark green. The postscutellum is black and densely punctured. It differs from typical *E. aurescens* Ckll. in the darker (not at all orange) red of mesothorax and scutellum; the more strongly and closely punctured clypeus, mesothorax, and scutellum; and the dusky wings, with green and rosy iridescence, and black stigma. The flagellum is entirely dark, not red beneath as in typical *E. aurescens*. The subspecies is modified in the direction of *E. ephippiata* Smith.

Gosford, N.S.W., Nov. 20, 1927 (*A. J. Turner*).

Euryglossa subsericea Cockerell.

Female: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*).

Euryglossa flavopicta ornatula Cockerell.

Female: Lugano, N.S.W. (*H. P. Schrader*). This is the form reported in 1916 from Queensland.

Pachyprosopis barbata Cockerell.

Twelve males: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*).

Pachyprosopis kellyi Cockerell.

Twelve females: National Park, Q., Dec. 1923 (*H. Hacker*).

Pachyprosopis angulifera n. sp.

Male. Length about 4·6 mm.; head shining bright lemon yellow (including mandibles), with the occiput, vertex, and upper part of front, except in middle, black; in the middle of front the yellow is continued upward, narrowing, to middle ocellus; scape yellow; flagellum dark above, pale yellow beneath except apically; thorax and legs bright yellow, but mesothorax black except broadly at sides, and a large mark anteriorly which is deeply emarginate behind, and takes the form of two broad yellow triangles joined at their apices; scutellum and axillæ yellow, but postscutellum and all of metathorax that can be seen from above, black; tegulæ pellucid; wings clear, with large dark-brown stigma and pale-brown nervures; second cubital cell narrow and produced above; abdomen dark brown, with yellow bands at bases of segments 2 to 5, often largely concealed by the segment before; extreme apex fulvous; venter yellow.

Six males: National Park, Q., Dec. 1923 (*H. Hacker*). Very distinct by the character of the yellow markings.

Pachyprosopis georgica n sp.

Female. Length about 6·3 mm.; head very large, wider than thorax, vertex and cheeks very large, eyes diverging below; clypeus very broad and short, the centre with a great deep basin about twice as broad as long, the whole polished, impunctate; mandibles very broad, bidentate, with a long apical tooth, and the base so placed that it is not at all parallel with the lower end of the eye, which touches the upper corner; checks beneath with a very large curved red tooth; surface of head polished and shining, reddish black, with the clypeus, mandibles (except apex), and checks posteriorly red, the red gradually shading into the darker colour of the other parts; antennæ pale red, scape very slender; prothorax, mesothorax, and scutellum shining terra-cotta red, other parts of thorax reddish black; tegulæ dark; wings hyaline, with dark stigma and nervures, second cubital cell long and narrow as usual in the genus, its form approximately lanceolate; basal nervure arched, falling a long way short of nervulus; first recurrent joining first cubital cell near end: legs bright ferruginous; abdomen with first segment and sides and base of second terra-cotta red, the rest black.

King George's Sound, W.A. (no other particulars known). A very distinct species, easily known by the large head, toothed below, the red mesothorax and scutellum, and the abdomen red basally and black apically.

PSEUDHYLÆUS new genus.

With the broad face and general build of *Euryglossa*, to which the species have been referred, but face markings more as in *Hylæus*. Mandibles pointed, moderately acute, simple in female, with an inner tooth in male; a small malar space, Caudal end of female very bristly, with no pygidial plate. Basal nervure moderately arched, not reaching nervulus; second cubital cell large and broad, receiving recurrent nervures near base and apex. Type *P. albocuneatus* (*Euryglossa albocuneata* Ckll.), and also including *P. hypoleucus* (*Euryglossa hypoleuca* Ckll.). These insects have had no satisfactory resting place, and it seems best to separate them as a distinct genus.

Pseudhylæus albocuneatus (Cockerell).

Two females, one male: Charleville, Queensland, Sept. 9-12, 1920 (*A. J. Turner*). The male is new. It is very like the male of *P. hypoleucus*, but larger and more robust, with the lateral face-marks more gradually attenuate above; scape thick, all black, flagellum very short, reddened beneath apically; mandibles with a light stripe, but lower side black; tegulæ dusky hyaline, with a large cream-coloured spot; third abdominal sternite with a very large outstanding black broadly truncate lamina. The labrum is sparsely covered with erect golden hairs. The anterior tibiæ are very broad, pale yellowish flushed with ferruginous, with a black stripe behind. The hind margins of the abdominal segments are broadly dull whitish, the first somewhat reddened. Stigma dark reddish brown.

Trigona cassiæ Cockerell.

Mr. Harold Hockings sends numerous examples, with the following interesting notes:—"Kootchar (native name) is from Brisbane district and exists in a wide area, many hundreds of miles north, south, and west, occupying tree hollows. Entrance to hive is through a tube of resinous mixture, which projects about an inch outwards from original opening; its diameter is from half to three-quarters inch; this tube is continued on the inner wall of the hive, into the food store. At night, outer opening is closed by a sheet of minute globules of sticky gum. Pollen and

Trigona wybenica n. sp.

Worker (type). Length about 3·75 mm.; head and thorax shining black, except that the scutellum, metathorax, and sides of thorax posteriorly vary from dull honey colour to black (perhaps a question of maturity); mandibles light yellowish ferruginous, darker and rounded at apex; malar space very short; labrum light yellow; face and front thinly beset with plumose white hairs; scape entirely clear orange-ferruginous; flagellum black or very dark above, reddened beneath, especially apically; sides of thorax with white pruinose pubescence; hair of scutellum pale and very short; tegulæ piceous; wings clear, stigma and nervures pale brownish; legs mainly black, but knees reddened and tarsi with small joints ferruginous, or (probably due to immaturity) the basitarsi may be reddish, and the hind tibiæ shining honey colour on inner side, with a large oval dark spot. The abdomen is short and in alcohol appears honey colour, but on drying it becomes very pale yellowish.

Male. Flagellum longer; abdomen dorsally dark brown, with the sutures pallid, beneath very pale yellowish, certainly very near to *T. læviceps* Smith, but differing by the very pale abdomen, and I think certainly distinct. Singapore must be considered the type locality of *T. læviceps*; for Aru I. specimen see Ann. Mag. Nat. Hist., Aug. 1923, p. 241. The specific name is derived from Wyben, which Mr. Hockings states is the native name of Thursday Island, where he collected the specimens.

Mr. Hockings sends the following notes :—" Is the smallest and has a yellowish abdomen : resembles Kootehar in some respects. Wax is dark chocolate; constructs a tubular protruding entrance as in Kootehar. Brood nest is a pile of pilular cells, also honey and pollen pots are constructed in separate positions; the brood nest sometimes is extended into any temporarily vacant adjacent space."

Megachile chrysopyga Smith.

Female: Perth, W.A. (*G. H. Hardy*). Male: Bunya Mts., Q., 3,000 ft., Jan. 4, 1926.

Megachile quinquelineata Cockerell.

Brisbane, March 18 (*H. Hacker*).

Megachile macleayi Cockerell.

Two females: Hughenden (*H. H. Batchelor*).

Megachile henrici Cockerell.

Female. Scopa with more black than usual. Lugano, N.S.W. (*H. P. Schrader*).

Megachile lucidiventris Smith.

Females: Lugano, N.S.W. (*H. P. Schrader*); Gordonvale (*W. C. Dormer*).

Megachile latipes Smith.

Males: Gordonvale (*W. C. Dormer*); Kiata, Victoria, Dec. 27 (*F. E. Wilson*). Is this the male of *M. lucidiventris* ?

Megachile semiluctuosa Smith.

Male: Linga, Viet., Oct. 1922 (*F. E. Wilson*).

honey pots are placed in separate positions, and are up to half an inch in diameter. Wax is very dark cream colour, but produces best of clear wax on being melted. Brood nest is a globular pile of pillular cells, somewhat less than an eighth of an inch in diameter, between which the bees can pass, opening being at top or inclined slightly in direction in which extension may be proceeding. All building proceeds upwards from 'base,' and as the young emerge at the bottom of the brood nest the old cells are cast out and a new brood nest starts and replaces the old one as it matures and is cast out. Diameter of nest varies with strength of colony. Period from deposit of egg to emergence is 65 days, extending to 70 days in cold weather. These cells are filled with food; the queen at once deposits egg on surface of food and cell is quickly closed by one worker; this filling to closing applies to all four varieties sent."

With the bees, Mr. Hockings sends some flies, larvæ, pupæ, and adults, collected (where ?) Jan. 1888, and labelled as parasites of *Trigona* (what species ?). They are a species of *Cerioides*, rather related to the Indian *C. ornatifrons* (Brunetti), but considerably larger. They are not really parasites.

Trigona carbonaria Smith.

Mr. Hockings sends many specimens from Moreton, with these notes:— "Karbi (native name). Is known from same district as Kootchar, and is at least as widely distributed. Entrance to hive is surrounded by an area of sticky resinous substance; honey and pollen pots are jumbled together indiscriminately, and are distinguishable only by breaking. Wax is dark chocolate. Brood nest see No. 3."

The pale hair on the dorsum of thorax has sparse black bristles intermixed. The flagellum is dark beneath, with at most a little red at base and more at apex.

On re-examining the type of *T. angophoræ* Cockerell I find no very substantial difference. The face at level of antennæ is of practically the same width, and the thoracic hair is essentially the same. The wings are unusually dusky, and the flagellum is ferruginous beneath. I think we must write *T. carbonaria angophoræ*, at least until the form is better known.

Trigona carbonaria hockingsi n. subsp.

Cape York Peninsula, a series sent by Mr. Hockings under his No. 3. It is distinctly larger than *T. carbonaria* (thus much too large for *T. birsi* Friese), and has the flagellum clear red beneath. The scutellum has much coarse black hair. Mr. Hockings writes: "It resembles No. 2 (*T. carbonaria*) in all respects, except that it is larger, and it builds a large cellular excrescence over the hive entrance and approaches; it is composed of resinous substance and dirt. The bees pass through its passages into the entrance. Wax dark choloeate. Brood nest is a one-sided comb in Nos. 2 and 3; it is constructed upwards, held in position by a framework of wax rods; it is in the form of a spiral staircase compressed, the middle region usually having the greatest diameter. The individual cells are larger than those of No. 2. As emergence ensues the brood nest is replaced as in all other varieties."

The *T. carbonaria* which I collected at Port Darwin have the flagellum rather obscurely reddened beneath, and coarse black hair on the scutellum, so they must really be referred to *hockingsi*, rather than to *carbonaria* proper. Perhaps *hockingsi* should stand as a distinct species; it is more distinct from *carbonaria* than is *angophoræ*.

Megachile gilbertiella Cockerell.

Female: Gordonvale, Oct. 1, 1922 (*W. C. Dormer*).

Megachile ciliatipes Cockerell.

I cannot separate this from the male of *Androgynella detersa* Ckll. Search should be made in Brisbane for *Androgynella* females.

Megachile cetera Cockerell.

I find no satisfactory character to separate the female of the Hawaiian *M. timberlakei* Ckll. from *M. cetera*. I have no Australian male closely resembling *M. timberlakei*.

Megachile alani n. sp.

Female. Length 11·5 mm., varying to 9·5; rather robust, but of parallel-sided type: black, including legs, mandibles, and antennæ, but tegument of sixth abdominal segment (above and below) and narrow apical margin of penultimate tergite, clear ferruginous: head large and broad, orbits slightly diverging below; mandibles very robust, strongly grooved, parallel-sided, the apical margin with three very short rounded teeth: clypeus broad and short, the anterior margin strongly concave, forming a broad arch, in the middle with two very large shining pits, separated by a small ridge, the clypeus otherwise very densely punctured; upper edge of clypeus shining but supraclypeal area densely and finely punctured; sides of face, on each side of supraclypeal area, dull and minutely granular, and front the same; vertex broad, closely but irregularly punctured; cheeks broad, the surface finely grooved or striate; a tuft of white hair at each side of face; front with thin white hair: vertex with very thin short brownish hair; mesothorax and scutellum dull and very densely punctured; conspicuous dense white hair-spots at posterior angles of mesothorax, at sides of prothorax, fringing tubercles, and (very small) between scutellum and mesothorax; mesopleura densely rugoso-punctate; thorax with very little hair, the pleura and metathorax showing loose white hair; tegulæ very dark reddish brown; wings hyaline, nervures and stigma dark; second cubital cell long, receiving first recurrent nervure at a distance from base about equal to half first intercubitus; legs with pale hair, conspicuous and silvery on outer side of tarsi, especially middle tarsi; hind tarsi not broadened; spurs whitish; abdomen convex, closely punctured, the hair-bands very inconspicuous, fulvescent, except pure white tufts on each side of first segment; apical segments with short appressed fulvous hair; ventral scopa white, fulvous at extreme tip.

Two from Moree, N.S.W., March 1923 (*Alan P. Dodd*). It is very like *M. rhodura* Ckll., but easily separated by the structure of the clypeus. In some tables it runs to *M. modesta* Sm., but that has the tegument of the apex of the abdomen black.

Megachile chrysopygopsis n. sp.

Female. Length about 12·5 mm.; broad and robust, with broad abdomen; black, including legs, but flagellum chestnut-red beneath, and apical tooth of mandibles red; mandibles broad, quadridentate counting the inner corner; clypeus ordinary, shining but closely and coarsely punctured, lower margin simple, nearly straight; supraclypeal area in middle of disc highly polished and shining; front and sides of face with long rather dull white hair; vertex with dark fuscous hair; cheeks with long white hair; mesothorax and scutellum shining but closely and very distinctly punctured; pleura and metathorax with long dull white hair; sides of mesothorax

and scutellum with short fuscous hair; white hair-spots at sides of prothorax, posterior corners of mesothorax, tubercles (large), and a rather inconspicuous interrupted band in scutello-mesothoracic suture; there is a tuft of dark-fuscous or sooty hair on each side behind the tegulæ; tegulæ black with a dark-red spot; wings dusky hyaline, dark in upper part of marginal cell; legs with pale hair, dark purplish brown on inner side of hind tarsi; hind basitarsi broad; spurs dark; abdomen finely punctured; hind margins of first three segments reddish, with narrow white (or slightly yellowish) hair-bands; fourth and fifth segments with fulvous bands, on fourth white at extreme sides; fifth segment (except at base and sides) and sixth (except the broad apex) clothed with reddish fulvous tomentum; ventral scopa white, black on last segment and sides of penultimate.

Perth, W. Australia (*G. H. Hardy*, 142). Looks like *M. chrysopyga* Smith, but hair of face not orange.

Megachile dinognatha n. sp.

Female. Length about 18·5 mm.; very robust with very large, broad, and rounded head; black, including mandibles, antennæ, tegulæ, and legs; hair of head and thorax very scanty, black on clypeus, white at sides of face, brownish white on front, dense and pure white at sides of metathorax, sooty on prothorax but white on tubercles; eyes purplish brown, strongly diverging below; mandibles extremely massive, strongly punctured, with two large teeth and a long cutting edge; clypeus very short and broad, very densely rugoso-punctate, the margin gently arched, shining and minutely crenulate; supraclypeal area densely rugose like clypeus; front with a pair of oblique obtuse ridges, which are polished and rather sparsely punctured; vertex shining, with irregular punctures of different sizes; cheeks very broad and rounded, polished, with scattered punctures; mesothorax and scutellum densely rugose, base of metathorax shining; wings dark fuscous, with violaceous tints; legs with prevailingly brown hair, bright ferruginous on inner side of hind tarsi; spurs dark; hind basitarsi not broadened; abdomen finely punctured, shining on third segment but dull on fourth; no hair-bands, but fifth and sixth segments covered with appressed copper-red hair; the punctures at sides of third segment are large and sparse, while those on fourth are small and close; ventral scopa pale yellow, becoming dark fuscous at apex.

Hughenden (*H. H. Batchelor*). I find no close relative of this species; in the tables it runs nearest to the quite different *M. ferox* Sm. It must be associated with the species referred to the subgenus *Eumegachile*.

Megachile semiclara n. sp.

Female. Length about 17·5 mm.: very robust, but of parallel-sided type; black, including mandibles, antennæ, tegulæ, and legs; hair of head and thorax mainly black, long and coarse on clypeus, short on mesothorax; on front, and upper part of sides of face, the hair is pale ochreous, mixed with black in middle; the thorax anteriorly below, and the tubercles, have white hair; mandibles massive, strongly grooved, with four large teeth; clypeus short and broad, dull, with a shining transverse apical ridge; supraclypeal area polished and impunctate in middle; ocelli large, amber colour; eyes reddish brown, inner orbits parallel; vertex moderately shining, with scattered large punctures; cheeks rounded, closely and minutely punctured; wings with more than basal half hyaline, the apical part fuscous, especially dark in marginal cell and the region below it; first recurrent nervure joining second cubital cell not far from base; mesothorax and scutellum dull and well

punctured, the scutellum densely covered with black hair ; legs with black hair, more or less shining pale on femora, coppery red on inner side of anterior tibiæ and tarsi, and middle tarsi ; the femora and tibiæ have the tegument more or less dark red ; hind basitarsi moderately broad ; spurs dark ; abdomen broad and rather short ; second and third tergites conspicuously polished in middle, the punctures on second large and widely scattered ; basal tergite with black hair, but second and third with conspicuous bands of pure-white hair ; fourth with a spot of white hair at each side ; ventral scopa pure-white, black at extreme apex.

Cairns, Queensland (*A. P. Dodd*). Mr. Hacker had already labelled it as a new species. It is a very beautiful and distinct thing, by its bicoloured wings resembling *M. fabricator* Smith.

Megachile batchelori n. sp.

Female. Length nearly 15 mm. ; robust, but parallel-sided ; black, including mandibles, antennæ (flagellum very faintly brownish beneath), tegulæ, and legs ; hair of head and thorax abundant, white, but black hairs intermixed on clypeus and front, hair of vertex all black, some admixture of black hairs on mesothorax ; eyes brown, inner orbits parallel ; mandibles very broad, with two large teeth and a broad cutting edge ; clypeus broad and rather short, dull and rough, covered with hair, but with a broadly arched shining transverse ridge above lower margin ; vertex shining, with scattered punctures ; cheeks finely and closely punctured, hairy ; mesothorax dull, with many punctures, which however are not very conspicuous ; base of metathorax dull ; wings with more than basal half clear hyaline, the apical part abruptly fuliginous ; first recurrent nervure joining second cubital cell near base ; basal nervure falling far short of nervulus , legs with much pale greyish hair, rusty black on inner side of hind tarsi, distinctly red on inner side of anterior tibiæ and tarsi ; hind basitarsi little broadened ; spurs dark, hind spurs unusually short ; abdomen with first segment densely covered with white hairs ; second and third segments with white hair-bands, thin in middle of third ; apical segments with short black hair ; second and third tergites shining ; ventral scopa pure white, black on last two segments.

Hughenden (*H. H. Batchelor*). Another species with bicoloured wings, like *M. fabricator*. *M. fabricator* appears to be closely allied, but has the face and front with pale ochreous pubescence, and the clypeus with black.

Megachile wilsoni n. sp.

Male. Length about 7 mm. ; small and parallel-sided, *Heriades*-like ; black, with the mandibles (except the bidentate apex), scape, tegulæ, and legs bright chestnut red ; face and front densely covered with long white hair ; eyes pale reddish grey ; facial quadrangle much longer than broad, eyes somewhat converging below ; flagellum long and slender, black, not enlarged at end ; vertex very densely punctured, but glistening between the punctures ; hair of thorax white ; mesothorax and scutellum very densely punctured (mesothorax coarsely), but glistening between the punctures ; area of metathorax basally rugose, apically shining ; wings hyaline, a little dusky apically, stigma and nervures dark ; second cubital cell long ; legs with thin white hair ; anterior tarsi quite simple ; anterior coxæ black, not spined ; abdomen well punctured, with distinct hair-bands, which are pale fulvous in middle, white at sides ; on the first segment the band is reduced to large lateral patches, on the second it is widely interrupted, on the third thin or narrowly interrupted in middle, on the fourth entire ; fifth and sixth segments densely covered with

pale-yellow tomentum, more whitish on sixth ; keel of sixth segment obtusely bilobed ; margins of segments at sides with the tegument red, but the apical segments are not red ; on the venter subapically are two little dark teeth.

Kiata, Victoria, Dec. 31, 1918 (*F. E. Wilson*). Named after the collector, who is a very keen and able entomologist. In the tables it runs near *M. kirbyana* Ckll. and *M. canifrons* Sm., but is quite distinct. *M. victoriæ* Ckll. is somewhat related, but has black legs.

Megachile hardyi n. sp.

Male. Length about 9 mm. ; parallel-sided, rather slender, the end of the abdomen curved downward and inward ; black, including mandibles and antennæ (flagellum very obscurely reddish beneath) ; tegulæ dark red ; knees, tibiæ, tarsi, and anterior femora except a streak above and below, bright chestnut red ; eyes dark grey, distinctly converging below, but face broad ; mandibles stout, bidentate ; clypeus closely and finely punctured, the edge simple ; a tuft of long white hair at each side of clypeus ; region of antennæ with abundant long greyish-white hair, vertex with dark-fuscous hair ; antennæ simple at apex ; mesothorax and scutellum glistening but very closely punctured ; postscutellum shining in middle ; thorax above with thin fuscous hair, at sides and behind with white ; mesopleura shining ; wings dusky hyaline, nervures and stigma dark ; first recurrent nervure joining second cubital cell some distance from base ; anterior tibiæ broad, the anterior face flat and shining ; anterior tarsi modified, the basitarsus with a large red expansion, while posteriorly there is a broad white fringe, and on the inner surface an elongate oval black spot ; anterior coxæ with well-developed spines, at the base of which is a patch of red hair ; abdomen dullish, closely and minutely punctured, the tegument red at posterior lateral corners of segments ; tegument of fifth segment not red except at extreme sides ; first segment with a thin fringe of white hair ; second and third each with conspicuous transverse bars or bands of pale-yellow hair laterally ; fourth with a pale-yellow apical band, broad and broadly angular in middle, rapidly narrowing to a point laterally ; fifth segment with the whole disc (but not the sides) covered by a dense pale-yellow or fulvous hair-patch ; sixth segment apically red and obtusely bilobed.

Blackheath, Nov. 23, 1919 (*G. H. Hardy*). Runs in the tables near *M. rufolobata* Ckll., or rather near *M. latericauda* Ckll., but is not closely related. There is some resemblance to *M. eucalypti* Ckll., but the anterior legs are quite different.

The following table will facilitate the separation of the above species :—

Females		1.
Males		10.
1. Apical part of abdomen with tegument red ; ventral scopa white		2.
Apical part of abdomen dorsally with some red or orange hair, but tegument not red		3.
Apical part of abdomen with neither tegument nor hair red		7.
2. Larger ; clypeus with an excavated shining area in apical middle	*alani* Ckll.	
Smaller ; clypeus without such an area	*gilbertiella* Ckll.	
3. Hair of face or front bright orange		4.
Hair of face and front not at all orange		5.
4. Abdomen in lateral profile gradually sloping apically ; scopa white, black only at apex	*chrysopyga* Sm.	
Abdomen in lateral profile rapidly descending ; scopa with more black	*henrici* Ckll.	

5. Abdomen with white hair-bands .. .. *chrysopygopsis* Ckll.
Abdomen without hair-bands .. .. 6.

6. Smaller ; red hair extending on fourth tergite .. .. *macleayi* Ckll.
Larger ; no red hair on fourth tergite .. .. *dinognatha* Ckll.

7. Abdomen with black hair at base ; mesopleura with black hair .. .. *semiclara* Ckll.
Abdomen with white hair at base .. .. 8.

8. Wings with sharply contrasting colours, dark apically, hyaline basally .. *batchelori* Ckll.
Wings without such contrasting colours .. .. 9.

9. Small species with hyaline wings .. .. *quinquelineata* Ckll.
Larger species with dark wings .. .. *lucidiventris* Sm.

10. Antennæ broadly expanded at apex ; face with white hair .. .. *semiluctuosa* Sm.
Antennæ not expanded at apex .. .. 11.

11. Face with white hair ; all the tibiæ red .. .. 12.
Face with yellow hair ; at least mid and hind tibiæ black.. .. .. 13.

12. Small ; scape red .. .. *wilsoni* Ckll.
Larger ; scape black .. .. *hardyi* Ckll.

13. End of abdomen with red hair .. .. *chrysopyga* Sm.
End of abdomen without red hair ; hind tarsi creamy white with black spots at ends of joints .. .. *latipes* Sm.

When in Queensland, I caught only one specimen of *Megachile*, a male, *M. rhodogastra* Ckll., at Sherwood, March 2. It seems probable that *M. rhodogastra* and *M. heliophila* Ckll. are the sexes of one species.

PARACOLLETES Smith.

Paracolletes callander Cockerell.

Male : Perth, W.A. (*G. H. Hardy*, 143).

Paracolletes fimbriatinus Cockerell.

Male and female : Stanthorpe, Q., 5–11–23 (No. 527). The female is new. It is related to *P. gallipes* Ckll. more than to any female I possess, but is very distinct from it. Thorax above with rich fulvous hair ; front with fulvous hair ; sides of face with very pale yellowish hair ; clypeus very coarsely rugose, not keeled (it has a median keel in *P. gallipes*) ; end of abdomen with very dark fuscous hair (all pale in *P. gallipes*) ; abdomen below with broad creamy-white bands ; hind spur pectinate with long teeth ; stigma small but distinctly developed. It is a rather slender bee, about 14 mm. long. This is distinct from *P. fimbriatus* Smith, which has the stigma obsolete, mandibles ferruginous at apex (black in *P. fimbriatinus*), thorax clothed above with whitish pubescence, and scopa of hind legs silvery white (in *P. fimbriatinus* black on outer side of hind tibiæ and very pale yellowish on inner side).

Paracolletes friesei n. sp.

Female. Length about 11 mm. ; rather robust ; head blue-green, shining, the clypeus black, convex, and sparsely punctured ; supraclypeal area brassy or coppery ; scape and base of flagellum black (the rest lost) ; mandibles black ; face at sides, front, and cheeks with long white hair, top of head with black hair ; front

dull in middle; thorax dark blue green or greenish blue, the mesothorax and scutellum yellowish green with strong rosy tints; mesothorax closely punctured, it and the scutellum densely covered with very bright orange-ferruginous hair; thorax at sides and posteriorly with long white hair, but sooty in region of tubercles, postscutellum, and sides of metathorax above: area of metathorax with a sharp transverse keel; tegulæ dark, slightly reddish: wings hyaline, nervures and the well-developed stigma dark reddish; basal nervure meeting nervulus; second cubital cell receiving recurrent about the middle: legs black, with the hair mainly black; much long white hair on under side of anterior femora, white hair at the base of middle and hind legs, and on anterior side of hind tibiæ; abdomen highly polished, weakly punctured, bluish green and steel blue, without hair-bands; hair at apex black; venter with fringes of white hair.

King George's Sound, W.A. Falls near to *P. plumosus* Sm. and *P. carinatus* Sm., but easily known by the bright-red thoracic hair. It is the species which Friese (1924) described as *P. fervidus*, but that name is preoccupied.

Paracolletes rebellis Cockerell.

Male: Jindebyne, N.S.W., 3,000 ft., March 1889 (*Helms*).

Paracolletes carinatus Smith.

Female: Mt. Tambourine, 1923 (*W. H. Davidson*). Male: Maria Island, 6–2–18 (*G. H. Hardy*).

Paracolletes bicristatus n. sp.

Female. Length about 8 mm.; robust, head black, with front and sides of face dark green; thorax black, with the mesothorax entirely dull, very dark blue or blue-black; scutellum black, with two shining areas on disc; metathorax dull at base, but the very obtuse transverse ridge of enclosure shining and appearing very faintly metallic; legs black, the tarsi slightly reddish, the hind basitarsi broad, pale ferruginous, dusky apically, with short hair on inner side, which seen from behind shines silvery white; abdomen somewhat shining, not evidently punctured, faintly greenish. Mandibles black, faintly reddened apically; antennæ black; clypeus polished and sparsely punctured; hair of head very inconspicuous, erect and fuscous on vertex; mesothorax with short very inconspicuous black hair, anteriorly with white, only visible on lateral view; tubercles with a large dense tuft of yellowish-white hair; at each side of scutellum is a dense very conspicuous band of pale-fulvous tomentum, these bands converging caudad; pleura with thin white hair; tegulæ black; wings hyaline, rosy-iridescent, stigma large, dark reddish, nervures fuscous; basal nervure arched, not quite reaching the oblique nervulus; second cubital cell much broadened below, receiving recurrent nervure at or a little before middle; marginal cell long and pointed; hind femora with a very large curled white scopa; hind tibiæ with hair on outer side dark fuscous, on inner white; abdomen without bands, hair at apex black, rather scanty; venter with a white scopa.

Two females: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*). One has collected much orange pollen. A very distinct species, easily known by the bands of pale-fulvous or whitish hair on each side of scutellum. In the cotype the tufts of hair on tubercles and sides of scutellum may be described as white.

Paracolletes advena worsfoldi (Cockerell).

A female from King George's Sound is evidently *P. worsfoldi* Ckll., described from a single female in the British Museum. It is however only a race of *P. advena* (Smith), differing by the distinctly more shining mesothorax, and details of the venation. The basal nervure meets the nervulus; the first recurrent nervure is abruptly bent some distance from its end, and joins the second cubital cell well before the middle. In *P. advena* from Victoria the basal nervure falls a little short of the nervulus, and the broad second cubital cell receives the recurrent nervure in middle or a little beyond. In Brisbane *P. advena* the basal nervure is conspicuously short of the nervulus, and the first recurrent reaches second cubital a little before the middle. Neither Brisbane nor Victoria bees show the abrupt bend in the recurrent. In Smith's type of *P. advena* the recurrent joins second cubital a little before middle, and the basal nervure falls short of nervulus.

Paracolletes nigrocinctus Cockerell.

Kojarena, near Geraldton, W.A., Sept. 6, 1926 (*Nicholson*). One female, seven males. A specimen will be sent to the Queensland Museum. *P. tenuicinctus* Ckll. and *P. nigrocinctus* Ckll. are the sexes of one species.

Paracolletes melbournensis clarki n. subsp.

Female. Length about 11 mm.; clypeus highly polished, with scattered though distinct punctures; vertex with sooty or grey hair; thorax above with rather pale grey hair; black on disc of mesothorax and scutellum; scutellum anteriorly smooth and lilac-tinted; pleura with dull-white hair, that in region of tubercles sooty; tegulæ very dark; wings strongly brownish; basal nervure meeting nervulus; second cubital cell receiving recurrent nervure about middle; abdomen olive green, without the strong punctures of *P. sexmaculatus* Ckll

Perth, W.A. (*J. Clark*).

Paracolletes plumosus Smith.

Female: Sydney, N.S.W. (*Froggatt*, 191).

Paracolletes eucalypti Cockerell.

This was described from a male taken at Healesville, V. The female before me comes from Beaconsfield, Victoria (*F. E. Wilson*), and while it differs from the male in the entirely black legs, and the basal nervure almost meeting the nervulus, I am confident that it belongs here. It is smaller than *P. plumosus* Sm., and is especially distinguished by the dullish minutely sculptured surface of the bluish-green abdomen. Under the compound microscope this surface shows fine transverse lineolation and excessively minute punctures. The anterior wings are 7 mm. long. The hair at sides of thorax is partly black and partly dull white. Hair of apex of abdomen black; first three ventral fringes white, fourth sooty. Hind tibia with hair black on outer side, white on inner. Dorsum of thorax with black hair, but white anteriorly. This agrees so nearly with what the female of *P. eucalypti* ought to be, that we are not entitled to assume the existence of another, extremely closely related, species.

May I venture to suggest, in connection with this specimen, that when bees are pinned with short pins, and placed very high up, it is extremely difficult to handle them without damage? They cannot be properly examined without looking at the

under side, and this involves holding the head of the pin. The Nicholson specimens from W. Australia are admirably mounted, but taking Australian bees as they come, from old or new lots, they are very often hard to handle.

Paracolletes microdontus n. sp.

Female. Length a little over 10 mm.; black, with no metallic tints anywhere; mandibles black, with a faint reddish tint subapically; tegulæ very dark reddish; legs black. Head broad, but facial quadrangle longer than wide; clypeus moderately convex, shining, with strong not very dense punctures, the disc somewhat flattened; lower margin and corners of clypeus, and sides of face, with silvery white hair; front and cheeks with white hair, but vertex with long black hair; antennæ black, the flagellum reddened beneath apically; mesothorax and scutellum shining on disc, with sparse small punctures; scutellum with no trace of a median sulcus (which is present in *P. tuberculatus* Ckll.), its posterior part dull; postscutellum with a small but distinct tubercle; area of metathorax dull, faintly shining on ridge, overlapped by long pale hairs; thorax above with short grey and black hair; much black on scutellum, and a broad black band across anterior part of mesothorax; tubercles with white hair; wings hyaline, slightly dusky; stigma dark reddish, very small and narrow, but distinct; nervures dark; basal nervure meeting nervulus; second cubital cell broad, receiving recurrent nervure a little before middle; third cubital very long, much extended below, receiving second recurrent some distance from end; scopa of hind tibiæ very long, grey on outer side, white on inner; abdomen without bands, dullish, the punctures excessively minute; first three segments broadly but thinly clothed basally with fine white pile, giving the basal halves of second and third segments (when extended) a grey appearance, contrasting with the black beyond; hind margins of segments broadly dark brownish, but the colour is too dark to give a banded effect; hair at apex of abdomen black; fourth ventral segment with much white hair, fifth with a fringe of black.

Two females from Perth, W.A. (*J. Clark*). The clypeus is totally different from that of *P. incanescens* Ckll. The dentate postscutellum and other characters separate it from *P. obscurus* Smith.

Paracolletes semilucens n. sp.

Female. Length about 8·5 mm.; black, small and rather slender, with rather the aspect of a male; head broad; mandibles black, faintly reddish at tip; clypeus convex, sparsely but distinctly punctured, the lower half shining, the upper half dull, but extreme upper edge shining; supraclypeal area dull, without evident punctures; sides of face with thin white hair, and no black; antennæ black, flagellum obscurely reddish below; front and vertex entirely dull; vertex with some long black hair; thorax with thin white hair at sides and behind, dorsally with very scanty fuscous hair; mesothorax dull, not evidently punctate, the posterior disc more shining; scutellum somewhat shining, hardly punctured, depressed in middle; base of metathorax with upper face large, shining, no transverse grooves or acute keel; tegulæ chestnut red; wings brownish hyaline, stigma and nervures dark reddish; stigma large; basal nervure falling a considerable distance short of nervulus; second cubital cell broadened below, receiving recurrent nervure distinctly beyond middle; third cubital elongated, receiving second recurrent some distance before end; legs black, scopa of hind tibiæ not very large, white, stained with fuscous posteriorly; spurs clear red; hair on inner side of hind tarsi appearing white in some lights, but pale orange in others; abdomen dullish, not evidently

punctured, hind margins of segments narrowly reddish ; no hair-bands, and very little hair, fourth tergite with a very thin fringe of pale hairs ; apex with a small tuft of reddish-black hair ; ventral fringes white ; at each side of first tergite is a little raised boss.

Two females : Type Perth, W.A. (*J. Clark*) ; the other Swan R. (*J. S. Clark*). It may be compared with *P. sigillatus* Ckll., but is very distinct by the lack of broad hyaline margins to the tergites, dark hair at apex of abdomen, and red tegulæ. It differs at once from *P. scitulus* Ckll. by the black anterior legs. The dull front easily separates it from *P. nigritulus* Ckll. Among the Smith species it seems nearest to *P. cinereus*, but not very closely allied.

Paracolletes rudis Cockerell.

One female : Swan River, W.A. (*J. S. Clark*). *P. rudis* was described in 1906 from a female from Swan River, received by the British Museum in 1869. It is a species with much the aspect of *P. advena* (Smith), but remarkable for the entirely dull surface of the thorax above.

Paracolletes nigroclypeatus hardyi n. subsp.

Female. Anterior wing 7·6 mm. Agrees in most respects with *P. nigroclypeatus* Ckll. (from Victoria), but differs especially by the black abdomen, with a different steel-blue band on each segment before the marginal depression. The clypeus is shining, with scattered irregular punctures, wholly black, but the front and sides of face are strong blue-green. The mesothorax has the disc shining, dark blue-green, and the polished sparsely punctured scutellum, with no median depression, is very decidedly green. Thus the insect presents the unusual condition of having the head and thorax more strongly metallic than the abdomen. Flagellum red beneath, especially toward the end : hair of face thin, a sort of dull pale yellowish (not white as in the typical race), of vertex black : disc of mesothorax and scutellum with short sooty hair, sides of thorax with dull greyish-white hair : tegulæ small, bright clear rufous ; wings dusky ; basal nervure meeting nervulus ; second cubital cell receiving first recurrent at middle ; third cubital receiving second recurrent almost at end ; legs obscure reddish ; apex of abdomen with black hair.

One female : Perth, W.A. (*G. H. Hardy*, 169). It is not surprising to find much specific and subspecific endemism in the bees of Western Australia, as according to Emily H. Pelloe, in her book on "Wild Flowers of Western Australia" (1921), there are more than 3,000 species of flowering plants peculiar to that region.

Paracolletes obscurus Smith.

Female : Russell Falls, National Park, Tasmania, 11–1–25. This agrees in venation with Smith's type, which I examined. It also has the characteristic dusky wings. The abdomen shows vague but quite perceptible purplish and greenish tints ; Smith found the abdomen of the female black, only that of the male obscurely metallic. The clypeus is very coarsely punctured, The abdominal hair-bands are thin ; not relatively white and conspicuous as in *P. advena* Sm. *P. subviridis* Ckll. is smaller and evidently different.

It is possible that Smith wrongly associated the sexes of *P. obscurus*, and that the present female belongs with his male ; but at present we have no adequate grounds for such an assumption.

Paracolletes chalybeatus Erichson.

Female: Russell Falls, National Park, Tasmania, 9–1–25. *P. providus* Smith is very doubtfully distinct. These bees need to be collected in series, with biological observations to determine whether there are several very closely allied species. *P. chalybeatus* is the type of *Lamprocolletes* Smith, which can be distinguished from typical *Paracolletes* by the well-developed stigma. The stigma varies very much in the group, and it is rather difficult to know where to draw the line. *Leioproctus* Smith, also with well-developed stigma, has priority of place over *Lamprocolletes*. It is figured as having a very long third cubital cell, with the second recurrent joining it far from the apex; the type is the New Zealand *L. imitatus* Smith. *P. chalybeatus*, the type of *Lamprocolletes*, has the third cubital very broad but much less produced, receiving the second recurrent nervure very near the end. The longer type of cubital cell occurs also in Australian species, as for instance *P. semilucens*, described above; but it does not seem possible to regard this as a generic character.

If we separate two genera on the character of the stigma, *Paracolletes* proper will include *P. rebellis*, *P. erythrurus*, *P. nigrocinctus*, *P. callander*, *P. erassipes*, *P. latifrons*, *P. ferricornis*. *Leioproctus* will be by far the larger genus, with *waterhousei*, *helichrysi*, *sigillatus*, *thornleighensis*, *platycephalus*, *fimbriatinus*, *gallipes*, *truncatulus*, *callurus*, *andreniformis*, *halictiformis*, *advena*, *subviridis*, *fervidus* and *fervidus subdolus*, *incanescens*, *tuberculatus* and *tuberculatus insularis*, *nitidulus*, *abnormis*, *sexmaculatus*, *ibex*, *minutus*, *obscurus*, *chalybeatus*, *leai*, *argentifrons*, *monticola*, *hudsoni*, *atronitens*, *euphenax*, *nigrofulvus*, *launcestonensis*, *providellus* and *providellus bacchalis*, *vestitus*, *castaneipes*, *metallicus*, *boltoni*, &c. It will also include the common metallic *carinatus* and *plumosus* of Smith.

Hylæus gracilicaudus Cockerell.

Female: King George's Sound. Close to *H. daveyi* Ckll., but tegulæ reddish, orange of postscutellum reduced; first cubital cell very long. In this specimen the first recurrent nervure meets the intercubitus.

Hylæus perconstrictus n. sp.

Male. Length about 9 mm.; rather robust, black; face very bright orange (but surface dull and punctured) up to level of antennæ, except the square supraclypeal area, which is entirely black; the lateral face-marks above are partly excavated by the antennal sockets, and the truncate upper end is a little produced near orbits; mandibles black, strongly bidentate; labrum with a yellow spot; scape black, ordinary; flagellum long (reaching scutellum), obscurely brownish beneath, the joints subnodose; third antennal joint partly red; tubercles and scutellum (except extreme sides) bright orange, but rest of thorax wholly black; mesothorax slightly shining, with large irregular punctures; postscutellum shining; area of metathorax short and poorly defined, somewhat shining, not evidently sculptured; pleura strongly punctured; tegulæ piceous, with an orange spot; wings clear, with black (or reddish black) stigma and nervures; second cubital cell very long, receiving first recurrent nervure very near base, second more remote from apex (in cotype the cell is shorter, and first recurrent enters extreme apex of first cubital); anterior and middle tibiæ with a pale reddish stripe in front; basitarsi pale yellowish or creamy white, the tarsi otherwise pale reddish; abdomen rugoso-punctate, first two tergites very strongly gibbous, with a deep constriction between, the elevation of the second tergite approaching the form of an obtuse keel.

Beaconsfield, Victoria (type locality), Jan. 27, 1919 (*F. E. Wilson*); Kiata, Victoria, Dec. 31, 1918 (*F. E. Wilson*). A remarkable species, known by the peculiar abdomen, lack of colour on postscutellum, and orange face with black supraclypeal area. Mr. Haeker had recognised it as probably new.

Hylæus honestus subhonestus n. sp.

Male. Length about 8·5 mm.: differs from *H. honestus* (Sm.), which was described from Tasmania, as follows:—Abdomen black, with perhaps the very faintest greenish tint: anterior tibiæ very broadly yellow in front, and a dagger-like small yellow mark at apex of their femora, middle tibiæ with the outer face entirely light yellow; wings strongly brownish; scutellum with a large broadly triangular orange mark, and postscutellum with a semi-circular broad mark. Mandibles with a small yellowish mark on upper edge: labrum with a small transverse yellow spot; clypeus and lateral marks bright orange, but the surface dull: lateral marks broadly angulate in middle above (*honestus* style); supraclypeal area black; scape black; flagellum obscurely brown beneath; tubercles orange: mesothorax dull, distinctly punctured; area of metathorax rough and entirely dull, but surface on each side of it somewhat shining: basal nervure meeting nervulus; first recurrent meeting intercubitus; second cubital cell long; stigma and nervures dark; no constriction between first and second tergites; venter of abdomen quite simple; abdomen distinctly punctured.

Sheffield, Jan. 8, 1917 (*G. H. Hardy*).

Hylæus hobartiellus n. sp.

Male. Length about 5·3 mm., slender, with the head broad, but the eyes strongly converging below. It is readily known from *H. hobartianus* (Ckll.) by the following characters:—Smaller: face, labrum, and mandibles light lemon yellow, the supraclypeal mark transverse, its upper edge straight; flagellum long and thick, ferruginous beneath; mesothorax, scutellum, and postscutellum shining; tubercles yellow with no black dot; wings only slightly dusky; stigma large, rufous; second recurrent nervure joining second cubital cell a little before end; coxæ in part, and trochanters entirely yellow; femora black, the anterior ones with a light apical streak; anterior and middle tibiæ pale reddish yellow, with a black mark behind; hind tibiæ black, with the basal two-fifths pale yellow; basitarsi very pale, but the small joints infuscated; abdomen narrow.

Hobart, Oct. 24, 1917 (*G. H. Hardy*).

Hylæus wynyardensis n. sp.

Female. Length about or nearly 6 mm.; black, with pale-yellow markings, consisting of narrow (but not linear) lateral face markings (ending very acutely near orbital margin some distance above level of antennæ), tubercles (no other light colour on thorax), and bases of tibiæ (of the last broadly); also the anterior tibiæ are pale reddish in front: face very broad, clypeus dullish, region of ocelli dull; flagellum dusky red beneath, not extremely long; thorax shining: scutellum large and flat; tegulæ black: wings hyaline, faintly dusky: stigma very large, dark brown; basal nervure falling short of nervulus: second cubital cell about as high as long, the recurrent nervures meeting the intercubiti, or the second not quite reaching intercubitus; abdomen broad and short, moderately shining, but second segment mainly dull, its apical margin brownish: no constriction between second and third tergites.

Wynyard, Feb. 1, 1916 (*G. H. Hardy*). Runs in my key to the vicinity of *H. hobartianus* Ckll., *H. semipersonatus* Ckll., *H. scintilla* Ckll., *H. hobartiellus* Ckll., and *H. quadriceps* Sm., but I cannot place it with any of them.

Hylæus elongatus (Smith).

Male: Geeveston, Dec. 24, 1914 (*G. H. Hardy*).

Hylæus simillimus tasmani Cockerell.

Described from Tasmania a female from Kosciusko, Jan. 22, 1914 (*A. J. Turner*), labelled by Mr. Hacker, "near but not *P. simillima* Sm.," is so close that I cannot venture to separate it. The area of metathorax is shining, not rugose, and the orange mark on postscutellum is broadly transverse. The male might show more difference, but at present I can only recognise one form.

Two other females, distinctly larger, with the first recurrent nervure more remote from base of second cubital cell, come from Hobart, Feb. 13, 1914 (*G. H. Hardy*) and Geeveston, Dec. 25, 1914 (*G. H. Hardy*). I refrain from separating these also, as they probably indicate no more than individual variation. They agree in the area of metathorax. *H. tasmani* is probably a distinct species.

Hylæus simillimus Smith. var. **tasmani** n. var. or race.

Female. Tubercles and scutellum bright yellow, axillæ black; postscutellum with a transversely oval yellow spot in middle; lateral face-marks ending in a sharp point above away from orbits; flagellum dull red beneath; vertex excessively closely and minutely punctured, and mesothorax the same, dull; area of metathorax somewhat shining, but not polished; mesopleura shining, with irregularly scattered punctures of different sizes; basal nervure practically meeting nervulus; second cubital cell large, with the recurrent nervures about equally distant from base and apex; abdomen very finely punctured above, beneath with large coarse punctures, abdomen very obscurely bluish.

Tasmania (no other particulars known). Probably a distinct subspecies, or else the female of *H. honestus* (Smith), which in the male has the yellow of scutellum also reduced.

Hylæus longmani n. sp.

Male. Length about 8 mm., rather slender; black, with the face (clypeus, long supraclypeal mark, and lateral marks ending acutely above level of antennæ) creamy white; tubercles broadly (but no mark behind), scutellum, and postscutellum bright orange; antennæ long, scape with a large wedge-shaped yellow mark in front, flagellum submoniliform, clear red beneath; mandibles black; mesothorax dull, excessively densely and minutely sculptured: area of metathorax small, dull, hardly defined; pleura excessively closely and minutely punctured; tegulæ black; wings dusky hyaline: basal nervure falling short of nervulus; second cubital cell very large, receiving recurrent nervures near base and apex; under side of thorax with much silky white hair; legs black, with very short silky white hair; anterior femora with a red stripe in front, their tibiæ broad, entirely pale red on inner face; abdomen shining, finely punctured, the first segment extremely closely and finely punctured; venter with coarse punctures, the margins of the segments suffusedly reddish.

Brisbane, Oct. 21, 1921 (*H. Hacker*). Mr. Hacker had already marked it as probably new. It closely resembles *H. aureomaculatus* (Ckll), but is easily known

by the much broader face, and the much more finely punctured first abdominal segment. I take pleasure in naming it after Heber A. Longman, the Director of the Queensland Museum, in recognition of his important services to Queensland zoology.

Hylæus semipersonatus n. sp.

Male. Length about 4·5 mm.; slender, but not excessively so; black, with the face creamy white up to level of top of the long clypeus (except a narrow black mark at each side of clypeus), leaving a broad black area between the light colour and the antennæ, which are placed high up; face narrow, inner orbits convex; mandibles black with a small light spot at base, and apex reddened; labrum black; scape very broad, broadly yellowish white in front; flagellum rather long, dull red beneath; malar space well developed, longitudinally striate; ocelli in a triangle; mesothorax somewhat shining, with a deep median groove, the surface microscopically lineolate and punctured; scutellum shining; area of metathorax large, dullish; thorax all black except the tubercles apically cream colour; tegulæ dark; wings greyish hyaline; stigma unusually small, very dark reddish; basal nervure falling short of nervulus; second cubital cell receiving recurrent nervures about equally distant from base and apex; legs black, with anterior tibiæ in front, spot at base of middle tibiæ, and base of hind tibiæ broadly, creamy white; abdomen shining.

Cradle Mountain, Jan. 18, 1917 (*G. H. Hardy*). A distinct little species, easily known by the partly masked face, with dark femora and mainly black mandibles.

Hylæus fijiensis (Cockerell).

In 1909 I described the splendid blue *Prosopis fijiensis* from a female in the British Museum, which had belonged to Smith. It was labelled as from the Fiji Islands. Now I find a female in the collection of the Queensland Museum, labelled Rye, Victoria, Dec. 1918 (*L. Barber*). One or the other locality must be wrong. The species seems out of place in the fauna of Victoria, and is in fact very different from anything known in Australia, with the exception of *Palæorhiza gigantea* Ckll., 1926, from Raymond Island. This is surely closely related, and should evidently stand as *Hylæus giganteus*, being wrongly referred to *Palæorhiza*. To the original description of *H. fijiensis* it should be added that the malar space is large, and the mandibles are blunt, tridentate, with the inner tooth very small.

I cannot find Raymond Island on any map. Raymond in N.S.W. is inland, not very far from Newcastle.

The large metallic species of the group of *H. fijiensis* and *H. giganteus* are so distinct from typical *Hylæus* that they may form a new subgenus *Meghylæus* with *H. giganteus* as type.

Hylæus albonitens (Cockerell).

Darwin (*G. F. Hill*).

Hylæus chromaticus (Cockerell).

Brookfield, Dec. 15, 1926 (*H. Hacker*).

Hylæus perrufus n. sp.

Female. Length about 5·6 mm.; rather slender, thorax entirely rather dull terra-cotta red, legs clear ferruginous. Head ordinary, black; mandibles and

lower half of cheeks dull red; facial quadrangle much longer than broad; face dull orange, including the long clypeus (which is narrowly reddened at sides), long supraclypeal mark extending upward between antennæ, and lateral marks which begin to narrow at level of antennæ, but are quite broad at sides of lower half of front, and have linear extensions along orbits on upper half; labrum orange; antennæ entirely clear ferruginous, the scape long and slender; mesothorax dull; tegulæ ferruginous; wings hyaline, with large very dark stigma; basal nervure strongly curved, falling just short of nervulus; second cubital cell about square, receiving recurrent nervures very near base and apex; abdomen red as far as middle of third segment, and beyond that black: no spots or bands.

Bunya Mts., Dec. 10, 1925 (*H. Hacker*). Related to *H. hæmatopoda* Ckll., but much smaller, with wholly red thorax.

Hylæus scintilla (Cockerell).

Female. Brisbane, Sept. 12, 1916 (*H. Hacker*); Logan road, at *Leptospermum*, Sept. 12. Close to *H. asperithorax* (Rayment), but smaller, with shorter head and paler stigma. The sculpture of the mesothorax resembles that of *H. asperithorax*.

Hylæus minusculus (Cockerell) var. a.

Male. Caloundra, Jan. 20, 1916. It is evidently more robust than the type, and may represent a distinct species, but there is only one specimen, not in the best condition. The markings, long antennæ, and other features agree with *H. minusculus*. Compared with *H. eburniellus* (Ckll.), it is smaller, with the upward extensions of lateral face-marks longer, and slender, and the flagellum very long and slender.

Hylæus spryi Cockerell.

Males from Maria Island, Jan. 1, and Triabunna, Dec. 27, both collected by G. H. Hardy. They differ from the type in having a small yellow mark on scape, and the orange mark on postscutellum is fairly large in the Triabunna specimen. As noted in the original description, this is closely related to *H. nubilosus* (Sm.). In the Triabunna specimen I can see that the tongue, though very short, is pointed. The sides of the face are more or less evidently sulcate. Thus the species is transitional toward *meroglossa*. Meade-Waldo, in his treatment of the group in Genera Insectorum, places *H. nubilosus* in *Palæorhiza*, but it is not close to the type of that genus. The whole group of *H. nubilosus* is evidently to be removed from *Hylæus*, but it is not precisely *Meroglossa* or *Palæorhiza*. I leave the matter for the present, to be dealt with in my work on Australian Bees.

Gnathoprosopis amiculina Cockerell.

Males from Stanthorpe, Queensland, Oct. 14 and 19, 1923.

Gnathoprosopis euxantha Cockerell.

Males from Brookfield, Nov. 15, 1926 (*H. Hacker*).

Gnathoprosopis aureopicta n. sp.

Female. Length about 5·7 mm.; black, with bright-orange lateral face-marks (broad-cuneate, ending rather obliquely about level of antennæ), and upper border of prothorax (interrupted in middle) with tubercles also bright orange; mandibles short and very broad, black, shining; clypeus dullish; front densely

punctured ; scape black ; flagellum dusky red beneath ; mesothorax densely and minutely punctured, the punctures not visible under a lens; base of metathorax dull and very finely sculptured, not sharply defined behind ; tegulæ black ; wings hyaline, faintly dusky ; stigma large, reddish black ; basal nervure meeting nervulus, and first recurrent meeting intercubitus ; legs black, the anterior tibiæ partly red on inner face, and hind tibiæ narrowly light yellow at base ; abdomen moderately shining ; venter quite simple.

Blackheath (type locality), Nov. 23 (*G. H. Hardy*) ; Stanthorpe, Nov. 10, 1923. Five specimens in all. This is not the female of *G. amiculina*, the female of which is known, and I am at a loss to associate it with any other male. It will be easily known by the broad-cuneate, lateral face-marks, not produced above. The interrupted prothoracic band is also characteristic, as Mr. Hacker had noted on a label attached to one of the specimens.

Palæorhiza melliceps Cockerell.

Two males : Tooloom, N.S.W., Jan. 1926 (*H. Hacker*). The head of the type was apparently somewhat discoloured. In the present specimens the light markings of the head are bright yellow, except that the sides of clypeus are dark red, this colour taking the form of two dagger-shaped marks, the points upward. The mandibles are red. The species is easily known by the shining black scutellum and yellow axillæ.

Palæorhiza melanura (Cockerell).

Female : Kuranda, Q., 1919 (*A. P. Dodd*).

This belongs to the peculiar group in which the area of metathorax is strongly grooved or fluted. It may be regarded as a distinct subgenus : *Heterorhiza*, type *P. melanura*.

The known species are separated thus :—

Abdomen in both sexes honey colour with the apex black .. .. *melanura* (Ckll.)

Abdomen with the ground colour dark or black .. .. 1.

1. Thorax with two yellow lines on dorsum : abdomen black or piceous, with (male) suffused red band on first segment, a red suffusion at bases of second and third, and a pale-yellow mark on each side of second ; or (female) two red spots on first segment, transverse yellow mark on each side of second, and two larger marks on third (Mackay, Q.) .. .. *denticauda* (Ckll.)

Thorax dorsally with four yellow stripes .. .. 2.

2. First abdominal segment with red base and two yellow marks ; segments 2 and 3 each with a pair of yellow spots ; antennæ red-brown (Mackay, Q.) .. .. .. *longiceps* (Friese) (female)

Abdomen without red : first segment with a broad V-shaped yellow mark on each side ; segments 2 to 4 each with lateral yellow marks ; antennæ dark, the scape with a yellow stripe ; wings brown (Murray Island, Torres St.) .. *hedleyi* Ckll. (male)

Friese described his species under *Prosopis* in 1924. (Konowia, vol. 3.)

The type of *P. hedleyi* is in the Australian Museum, but there is also a specimen in the Queensland Museum.

Prosopis eximius Smith, from Batchian, Moluccas, is to be called *Palæorhiza eximia*. I examined the type in the Hope Museum at Oxford. It is a male, with abdomen appearing broadly truncate at apex, with a spine at each corner, as in

P. hedleyi. The second cubital cell is square; head produced into a broad snout, malar space long, abdominal segments 3 and 4 each with a pair of large round black spots.

Palæorhiza viridifrons Cockerell.

Female: Dayboro, Jan. 27, 1928 (*H. Hacker*).

Meroglossa persulcata Cockerell.

Nanango district, Q., Nov. 1927 (*H. Hacker*).

Halictus leichardti Cockerell.

Females: Dunk Is., Q., Aug. 1927 (*H. Hacker*).

Parasphecodes tooloomensis n. sp.

Female. Exactly like *P. aurantiacus* Ckll., except as follows:—Mesothorax posteriorly black, only the broad anterior portion red; area of metathorax wholly or largely black; first abdominal segment with a very broad transverse band of blackish suffusion, variably developed, but the segment never clear light red across the middle; apical part of abdomen red, not black. The wings are strongly dusky.

Eight females: Tooloom, N.S.W., Jan. 1926 (*H. Hacker*). Perhaps to be regarded as a race of *P. aurantiacus*, but it is easily recognisable.

Lithurgus atratiformis Cockerell.

Brisbane, Jan. 18, 1923 (*H. Hacker*).

Cœlioxys reginæ Cockerell.

Female: Port Darwin (*H. W. Brown*).

Cœlioxys biroi Friese.

Female: Rorona, Papua, May 27, 1923 (*T. K. Scheibel*). Smaller than the type, only about 10 mm. long, and the abdominal bands white, but surely not a distinct species.

Euryglossina perpusilla Cockerell.

Caloundra, Jan. 20, 1916; numerous specimens, of both sexes.

Euryglossina flaviventris Cockerell.

Female. Oxley, Brisbane, Sept. 24, 1914 (*H. Hacker*). Also taken Sept. 19, 1916.

Euryglossina flaviventris var. **fuscescens** n. var.

Female. Lateral face-marks wholly wanting: venter of abdomen rather dark brown.

Brisbane, Sept. 10, 1915 (*H. Hacker*). I should have taken this for a distinct species, were it not that typical *E. flaviventris* occurs at Brisbane, and a second specimen taken at the same time and place as the var. *fuscescens* shows the apical two-fifths of venter orange-yellow, the colour abruptly separated from the brown. The brownish colour includes the first three sternites.

Euryglossina flaviventris var. **personata** n. var.

Female. With the yellow abdominal venter and minute linear lateral face-marks of the typical form, but clypeus and supraclypeal area wholly black.

Brisbane, Sept. 10, 1915 (*H. Hacker*). Taken with var. *fuscescens*.

Euryglossina semiflava n. sp.

Female. Length about 3 mm.; head and thorax shining black, with the following parts clear pale yellow: mandibles, labrum, entire face to a short distance above antennæ, narrow bands along inner orbits to tops of eyes, entire cheeks (but occiput black), prothorax except middle, tubercles, and anterior part of pleura (abruptly limited); scape slender, yellow in front, flagellum stout, ferruginous beneath, legs pale yellow, hind tibiæ brown, their tarsi paler: abdomen broad, dark brown, with a faint purplish tint, first two segments with very slender but evident pale bands at apex, terminal segment pale orange, venter yellow. The mesothorax is microscopically reticulate, with very few minute punctures. Tegulæ pallid; wings hyaline, stigma bordered with fuscous; venation normal for genus; second cubital cell about as high as broad; first recurrent nervure to first intercubitus much less than (but more than half) length of intercubitus; second recurrent nervure about half as far from second intercubitus; three complete discoidal cells; lower section of basal nervure strongly arched.

Brisbane, Feb. 5, 1916 (*H. Hacker*). It was taken with *Turnerella atomaria* (Ckll.). It will be readily known by the yellow face, and sides of thorax with anterior half yellow, the rest black. In its markings, this very closely simulates *Pachyprosopis humeralis* Ckll., which is easily distinguished by the shape of the second cubital cell.

Euryglossina hypochroma Cockerell.

Male. Oxley, Brisbane, Sept. 24, 1914 (H. *Hacker*). This was described from Perth, W.A., but I cannot see that the Brisbane specimen differs at all.

Euryglossina philoxantha n. sp.

Male. Similar in appearance to *E. perpusilla* Ckll., and found with it, but easily distinguished by the fact that the face is all yellow up to the level of the antennæ (in *perpusilla* are large black wedge-shaped spaces below antennæ); the supraclypeal yellow comes to a point between the antennæ; the lateral marks fill the space between clypeus and eye, and reach to the bases of antennæ, thence narrowing (the inner edge gently convex) to the orbits; scape stout, yellow in front. As in *E. perpusilla*, the legs and tubercles are yellow, but the prothorax is also yellow right across. The abdomen is about the same, but varies to more pallid, with the sutures more or less testaceous; the abdominal venter is honey yellow, and the extreme apex dorsally is red, a feature hardly visible without the microscope. The front is microscopically tessellate. Tegulæ hyaline, with a yellow spot; wings clear, stigma and nervures dilute sepia; third discoidal cell complete; first recurrent to first intercubitus not greater than length of intercubitus, but greater than distance of second recurrent from end of second cubital cell; lower section of basal nervure strongly arched; basal nervure to nervulus hardly equal to half length of lower section of basal nervure; anterior and posterior sides of third discoidal cell parallel.

(*E. perpusilla* has first recurrent nervure reaching second cubital cell near end, the distance less than equal to half of intercubitus; and second recurrent reaching second cubital cell a little more remote from end than first recurrent from end of first cubital.)

The type specimen of *E. philoxantha* was taken at Brisbane, Oct. 1911 (*H. Hacker*); others were collected Sept. 12, 1913.

Turnerella pachycephala n. sp.

Female. Length about 2·8 mm.; head and thorax black, the mesothorax microscopically reticulate and very sparsely punctured; head large, quadrate, very thick, shining: mandibles pale stramineous, with black apex, which is bidentate, but only the outer tooth acute; face all black, but labrum stramineous, with long pale hairs; tegulæ stramineous; wings clear, stigma pale brown, nervures colourless; marginal cell very broad (deep); first recurrent nervure joining cubital cell some distance before its end; basal nervure with lower section curved, falling far short of nervulus; two complete discoidals; legs pale yellow; antennæ placed close together, the flagellum very short and stout, reddish beneath; abdomen very dark brown, nearly black, the extreme apex dull yellowish; venter dark brown, apically (more or less abruptly) stramineous.

Two females, Aug. 10, 1913 (*H. Hacker*). Readily known from the other described species by the dark abdomen and face. It differs from typical *Turnerella* in having the cubital cell extending beyond the end of the first discoidal.

Turnerella globuliceps (Cockerell).

Brisbane, Feb. 12, 1918 (*H. Hacker*). This was described as *Euryglossella*, but a new study of these minute bees convinces me that the latter genus should not include the three species described subsequently to the original type (*E. minima* Ckll.). The two genera may be readily separated by the venation, as follows:—

(1.) *Euryglossella minima* Ckll. Marginal cell not so long as in *Turnerella*; no trace of upper end of second intercubitus; distance from recurrent nervure to intercubitus rather more than equal to length of intercubitus; lower section of basal nervure practically straight: distance from lower end of basal nervure to nervulus rather more than equal to length of lower section of basal nervure; no second discoidal.

(2.) *Turnerella*, as represented by *T. globuliceps* (Ckll.), *T. nothula* (Ckll.), and *T. atomaria* (Ckll.), until now placed in *Euryglossella*. Marginal cell long and pointed, poststigmatal part much longer than substigmatal; upper end of second intercubitus present; distance from recurrent nervure to intercubitus about equal to half length of the latter; lower section of basal nervure strongly arched; distance from basal nervure to nervulus equal to about half length of lower section of basal nervure (drawn too long in Meade-Waldo's figure of *T. gilberti* Ckll.); second discoidal cell complete.

Turnerella atomaria (Cockerell).

Brisbane, Feb. 15, 1916; Sept. 19, 1916 (*H. Hacker*). In my original description, I failed to note that the mandibles have a large tooth beneath, near the base. The lateral face-marks may fall conspicuously short of the clypeus, or may practically reach it. The triangular yellow mark on the cheeks behind the mandibles is characteristic, but it may be small. The under side of abdomen is pale yellow.

Turnerella atomaria var. **fusciventris** n. var.

Female. Length hardly 3 mm.; head and thorax shining black; abdomen very dark, slightly purplish, the extreme apex dull red, the ventral surface dark brown: the following parts are reddish yellow: clypeus (the lower part dusky, and with very long outstanding pale hairs), lower part of supraclypeal area, and lateral face-

marks (consisting of narrow bands along orbits, not meeting clypeal yellow, and ending about halfway up orbits); mandibles yellow, toothed beneath near base; a small triangular yellow spot on cheeks, behind mandibles; front highly polished, convex; antennæ dark, scape black, flagellum very stout and short; tubercles entirely black; tegulæ reddish; legs reddish orange (apparently reddened by cyanide), hind tarsi dusky; wings clear, stigma with dusky margin; marginal cell long; rudiment of second intercubitus present; second discoidal complete; lower section of basal nervure strongly arched; basal nervure to nervulus about equal to half lower section of basal nervure; recurrent nervure to intercubitus less than length of intercubitus.

Brisbane, Oct. 3, 1916 (*H. Hacker*). Known by the dark abdominal venter and reduced yellow of supraclypeal area. I do not know whether it is a variation or a distinct species, but the first supposition seems more probable.

Turnerella macrostoma n. sp.

Female. Length about 3·5 mm.; head and thorax shining black; abdomen broad, dark purple, the ventral surface light yellow; head very large and broad, quadrate; clypeus, triangular supraclypeal area, band-like lateral marks along inner orbits going narrowly to top of eyes, and very large patch on lowermost part of cheeks, all yellow: cheeks broad and rounded, shining; mandibles pale yellowish; antennæ pale rufo-testaceous beneath; funicle short and broad, subglobose; flagellum stout and short; prothorax very small, black, but tubercles margined with yellow; a very minute yellow spot below wings; vertex, mesothorax, and scutellum microscopically reticulate, with extremely minute very sparse punctures; metathorax short; tegulæ rufo-testaceous; wings hyaline, stigma rather light brown; lower section of basal nervure strongly arched; basal nervure to nervulus about equal to half lower section of basal nervure; no part of second intercubitus developed, but cubital nervure prolonged some distance beyond first intercubitus; recurrent nervure to intercubitus about or nearly equal to length of intercubitus; second discoidal cell complete; anterior femora stout, dark brown, their tibiæ and tarsi pellucid honey colour; middle legs with base yellow, including femora, but apex of femora and all beyond, brown; hind legs yellow as far as middle of femora, and beyond that brown; claws simple; pulvilli very large; abdomen not pale at apex.

Brisbane, Queensland, Oct. 3, 1916 (*H. Hacker*). Allied to *T. atomaria*, but easily separated by the very large head, very broad in region of mouth, the yellow face-markings, and the higher clypeus, with proportionately smaller supraclypeal light area. There is a strong general resemblance to *Euryglossina hypochroma* Ckll. and *E. semipurpurea* Ckll.

Turnerella semiflava n. sp.

Female. Length about 3 mm.; head and thorax above shining black, but the following parts are yellow: clypeus, supraclypeal area, lateral face-marks (broad below, and continued as narrow bands along orbits, enclosing short black facial foveæ, and ending at top of eye as an obtuse or angular projection anterior to and away from eye), mandibles, cheeks, sides of thorax (except a rather large black spot on lower part posteriorly), as well as legs and under side of abdomen; above, the abdomen is dark, slightly purplish, but more or less distinctly yellow along the sides: the extreme apex is light red, but this may be very distinct or retracted and hardly visible. Scape dark; flagellum very short and stout, bristly, somewhat yellowish beneath; claws simple; tegulæ hyaline with a yellow spot; wings clear, stigma

brown ; rudiment of second intercubitus present ; recurrent nervure to intercubitus less than half length of latter ; basal nervure to nervulus less than half length of the arched lower section of basal nervure ; second discoidal cell complete.

Brisbane, Queensland, Sept. 10, 1915 (*H. Hacker*). Readily known by the yellow cheeks and sides of thorax. Three were collected.

Turnerella subnothula n. sp.

Female. A black species like *T. globuliceps*, for which I had taken it, but distinct by the following characters : front not highly polished, the surface densely minutely reticulate all over, as is also the surface of mesothorax ; anterior tibiæ and tarsi red, the tibiæ dark brown behind ; abdomen larger, with a distinct rosy or coppery tint, the apical part with scattered long white hairs. The venational characters are : upper half of second intercubitus present ; second discoidal cell complete ; first recurrent nervure to first intercubitus less, but not much less, than length of intercubitus ; lower section of basal nervure strongly arched ; basal nervure to nervulus less than half length of lower section of basal nervure. It is also very like *T. nothula*, differing thus : mandibles only dusky reddish, with dark base ; face wholly black, without the narrow yellow bands along orbits, which are present in *T. nothula* ; long linear facial foveæ close to anterior orbits, and a row of punctures on the shining space between fovea and orbit (*T. nothula* has extremely short foveæ.)

Oxley, Brisbane, Sept. 24, 1914 (*H. Hacker*).

ZALYGUS new genus.

Minute bees related to *Euryglossella*, but with bidentate clypeus, two discoidal cells, and simple claws. One cubital cell ; two discoidals, the first with its upper side occupying only about half lower face of cubital : lower section of basal nervure very little curved ; basal nervure very remote from nervulus.

Zalygus cornutus n. sp.

Female. Estimated length 3 mm., but abdomen missing (it is presumably black and without salient characters) : head nearly as large as thorax, quadrate, shining black, with very delicate linear sculpture, forming a very fine reticulation, and with very minute remote punctures ; cheeks very broad, convex ; ocelli in a broad triangle, the lateral ocelli somewhat more distant from each other than from eye ; inner orbits gently concave ; antennæ placed low down, close together ; scape long, it and the large funicle dull testaceous ; flagellum short and thick, finely and quite densely hairy, very dark brown ; clypeus very broad, very pale yellowish testaceous, with scattered very long erect colourless hairs, the anterior margin straight in middle, but at each side prolonged into a very large outwardly directed tooth ; mandibles stout at base, tapering to apex, testaceous, the extreme tip black, the apex briefly and obtusely bidentate (seen from one direction appearing quite simple) ; thorax shining black, microscopically reticulate, with very widely scattered minute punctures, and almost hairless ; scutellum large, convex ; tegulæ yellowish hyaline ; wings hyaline, stigma dilute sepia, nervures nearly colourless ; stigma very large ; marginal cell broad (deep) but short, acutely pointed on costa, its face on costa about as long as that on stigma ; one cubital cell, which is very large ; upper section of basal nervure not far from vertical, lower oblique and very little curved, and not much longer ; lower end of basal nervure more distant from nervulus than the equivalent of the whole lower section ; two discoidal cells, the first elongate-quadrate, its face on first cubital approximately equivalent to half lower side of latter ; second discoidal greatly broadened below, both ends acute ; outer border of wings with

a fine delicate short fringe; legs with mainly dark coxæ, testaceous trochanters, black femora, testaceous knees, dark-brown tibiæ which are pale testaceous at apex, and pale testaceous tarsi; claws simple. The labial palpi have the terminal joint slender and very long. Although the insect is so bare of pubescence it is possible to find plumose hairs, as in all bees.

Brisbane, Queensland, Sept. 26, 1916 (*H. Hacker*).

This might be considered a subgenus of *Euryglossella*, but it seems better to regard it as a separate genus.

Heterapis hackeriella n. sp.

Female. Length about 4 mm. Shining black; head rather small, rounded, about as broad as long; clypeus, supraclypeal region, labrum, and mandibles dull rufo-testaceous; sides of face black, with no pale line along orbits; antennæ rufescent beneath; tubercles pale lemon yellow; a yellow stripe along upper border of prothorax, not nearly reaching tubercles; basal area of metathorax extremely large, longer than scutellum with postscutellum, and dull, contrasting with the shining parts anterior to it: tegulæ black; wings clear, with very dark stigma; legs black, anterior tibiæ pale red in front, hind tibiæ broadly cream-colour at base; abdomen fusiform, broadest at third segment.

Brisbane (*H. Hacker*); taken (including type) Nov. 7, 1917; also Feb. 15, Sept. 19, and Oct. 3, 1916. Certain specimens (Aug. 10, 1913, and Sept. 12, 1916) have pale lines along anterior orbits; and one (Sept. 17, 1914) has a black clypeus. So far as I can see at present these represent variations. The species is nearest to *H. delicata* Ckll., but distinguished by the round head and the character of the markings. It has the peculiar hairs on anterior tarsi.

MICRODONTURA new genus.

Small bees related to *Euryglossina*, and perhaps only subgenerically distinct, but last abdominal sternite produced into a spine (compare *Osiris*); wings with two cubital and two discoidal cells, the third discoidal absent.

Microdontura mellea n. sp.

Female. Length about 3·5 mm.; head, thorax, and the long parallel-sided abdomen dorsally light reddish brown, approaching honey colour, but more dusky; metathorax practically black, contrasting with the paler scutellum and postscutellum; ventral side of body throughout paler, the colour much lighter and clearer; face and very narrow line along anterior orbits pale yellow; labrum and mandibles testaceous, the latter black apically; eyes pale green; cheeks broad and convex, very pale, contrasting with the dark occiput; head broad, thick, quadrate; scape pale reddish, rather long and slender; funicle long-oval; flagellum short and stout, pale reddish, dusky above; mesothorax bare, microscopically transversely lineolate; area of metathorax shorter than scutellum and postscutellum together; tegulæ pale rufo-testaceous; abdomen bare, excessively minutely transversely lineolate; last ventral segment produced into a slender spine, which is bristly beneath.

Wings hyaline; stigma hyaline, with faintly dusky margin, the costal side not bristly; marginal cell long, pointed; two cubital cells, but only two discoidals; second cubital subquadrate, but narrowed above; recurrent nervure to first intercubitus a distance about equal to length of intercubitus; lower section of basal nervure strongly arched; basal nervure to nervulus equal to less than half lower section of basal nervure.

Brisbane, March, 7, 1918 (*H. Hacker*).

Halictus musicus Cockerell.

Tooloom, Jan. 26 (*Hacker*).

Halictus repertulus Cockerell.

Brisbane, Nov. 19, 1913, and Sept. 25, 1919 (*Hacker*).

Halictus mesembryanthemi Cockerell.

Brisbane, Nov. 20, 1917 (*Hacker*). I am surprised to see it from so far north.

Halictus semipolitus Cockerell.

Tambourine Mountain, at flowers of *Helichrysum bracteatum*, Oct. 27, 1912 (*Hacker*); Bribie I., Jan. 1917 (*Hacker*); Brisbane, Sept. 20, 1916 (*Hacker*).

Halictus lanarius Smith.

Adaminaby, N.S.W., Oct. 19, 1918.

Halictus griseovittatus Cockerell.

Brisbane, Oct. 24, 1916 (*Hacker*); Sunnybank, at *Leptospermum*.

Halictus helichrysi Cockerell.

Tambourine Mountain, Dec. 28, 1911 (*Hacker*).

Halictus orbatus Smith.

Brisbane, Sept. 9, 1912 (*Hacker*); Stanthorpe, Sept. 19, 1922, at fruit blossoms; Tooloom, N.S.W., Jan. 1926 (*Hacker*). The Tooloom specimens have more distinct abdominal bands, and one of the Stanthorpe ones has the mesothorax rougher, but I believe that all (♀) belong to the same species. However, Australian collectors should obtain the males, and see if possibly *H. orbatus*, as now understood, is composite.

Parasphecodes atronitens Cockerell.

Nanango District, Queensland, Nov. 1927 (*Hacker*).

NEW SPECIES OF AUSTRALIAN TINGITIDÆ (HEMIPTERA).

By Henry Hacker, F.E.S.

(Plates XXXII-XXXV, and Text-figure 1.)

The following paper adds fifteen species to the Australian Tingitid fauna, thirteen of which were collected in Queensland. Several genera, such as the Neotropical *Tigava* and the Oriental *Urentius*, are here recorded from Australia, and two new genera are proposed. With two exceptions, all the types have been deposited in the Queensland Museum.

Subfamily CANTACADERINÆ.

Cantacader nocturnis n. sp.

(Plate XXXII, figure 1.)

Head elongate, narrowed in front, armed above with four slightly curved porrect spines; antenniferous tubercles produced into a spine on each side; bucculæ prominent, converging and touching beyond head; the rostrum reaches to the second abdominal segment: antennæ slender, segment I stouter and half as long again as the second: III long and filiform: IV fusiform, pilose, as long as I and II conjoined. Pronotum with five longitudinal carinæ, the central one straight, the others convexly curved on the disc; the outer pair extend about halfway to the anterior border, and are anteriorly slightly inclined towards the others; sides dilated, reticulated, with four rows of small areolæ at the widest part; anterior angles rectangular; posterior angles rounded; posterior border subangularly produced in the middle. Elytra somewhat narrowly ovate, closely reticulated; costal membrane uniseriate throughout; costal area triseriate anteriorly, narrower and biseriate in the middle, wider and quadriseriate posteriorly; the discoidal area is divided by a strongly raised longitudinal vein without lateral branches: the wings are much longer than the abdomen.

General colour pale brownish grey. Head and disc of pronotum brown, opaque: elytral membrane subhyaline, the reticulations varying from light to dark brown: a narrow blackish line on the inner margin of clavus, continuing on the inner margin of discoidal area as far as the intersection of the longitudinal vein: a pale spot at the apex of the clavus; dark reticulations on the costal membrane and area about the middle; abdomen beneath pale ochraceous with a brown longitudinal stripe along the spiracles at each side. Legs and antennæ pale flavous. Eyes reddish black. Length 4 mm.; breadth 1·375 mm.

Holotype.—Brisbane, Queensland (H. Hacker), February. Taken at light. *He. 3360.*

Paratypes.—Same data, and Brisbane (L. Franzen). At light.

The above species of *Cantacader* is more typical of the genus than any previously described from Australia. It belongs to Distant's section A. Short lateral pronotal carinæ well separated from adjoining carinæ. Its shape resembles that of *C. quinquecostatus* Fieb as figured in Fauna British India II. p. 124 1904, but the costal area is narrower, with fewer rows of areolæ.

Subfamily TINGITINÆ.

Tigava unicarinata n. sp.

(Plate XXXII, figure 2.)

Elongate and slender. Head smooth, nearly as long as wide, armed with five spines; two basally at sides depressed, parallel, nearly reaching to the base of antennæ; between these anteriorly are three shorter semi-erect spines in a triangle, the anterior pair slightly divergent; antennal segment I four times longer than the second, III very long and slender, four and a-half times longer than the first; IV about as long as the first, fusiform and clothed with short hairs; rostral sulcus circular behind; the rostrum reaches halfway between the anterior and intermediate coxæ. Pronotum coarsely but shallowly punctate, reticulate on the posterior angle which is long and acutely pointed; anterior margin truncate; lateral margins anteriorly narrowly carinate; median carina percurrent; lateral carinæ absent; disc moderately convex. Elytra long, constricted slightly beyond the middle, widening and rounded posteriorly; the areolæ are small and rounded, slightly larger on the sutural area apically; costal membrane very narrow, carina-like; costal area biseriate, triseriate at apex of discoidal area; discoidal area with about seven irregular rows of small areolæ; wings much longer than the abdomen.

General colour pale yellowish brown with darker brown markings. Head testaceous brown, the three anterior spines concolorous; the basal pair, pronotal carina, lateral pronotal margins, a longtiudinal stripe on disc at each side of the median carina, the posterior angle apically and the bucculæ, whitish; the inner anterior discoidal border, a narrow interrupted fascia at apex of discoidal area, and a large triangular suffusion on the sutural area reaching to the outer border apically, reddish brown; antennal segment I, orange; segment IV, black; segments II and III, and the legs, testaceous; eyes ruby. Length 1·125 mm.; breadth ·875 mm.

Holotype.—Gold Creek, Q., May (H. Haeker). *He. 3361.*

Urentius sarinæ n. sp.

(Plate XXXII, figure 3.)

Head small, armed with five slender spines, two basally at sides, one submedial, and two in front; antennæ rather short, thinly setose and widely separated at the base; segments I and II about the same length, short and stout, moniliform; III cylindrical, twice as long as the fourth; IV longer than the first and second conjoined, swollen towards the apex. Pronotum broad, reticulated; tricarinate on the posterior angle; disc moderately convex, with strong irregular carinations enclosing three lateral foveate areas; the inner boundaries to these areas form fairly straight carinæ, subparallel to the median carina; all the carinæ, also the lateral margins of pronotum and elytra, are armed with long slender spines; hood small, sharply carinate above and projecting over the base of head. Elytra sinuately curved outwards from the base to their greatest width; sides nearly straight and narrowed posteriorly; the discoidal area is obliquely divided by a branch from the outer margin; costal area biareolate, the areolæ small, about the same size as those in the discoidal area; costal membrane mostly biareolate, but uniareolate towards the apex, the areolæ rather large.

General colour pale ochraceous brown; a few spines and nervelets crossing the discoidal area at the middle, a few at the apex, and the base of the posterior angle narrowly, fuscous; head, body beneath and the tarsal claws, black; the

femora, basal and apical antennal segments, brownish testaceous; third segment and the tibiæ, testaceous. Length 2 mm.; breadth ·875 mm.

Holotype.—Sarina, North Queensland (J. H. Smith). *He. 3362.*

Paratype.—Same data, in Department of Agriculture.

There are five head spines on this species, but the basal pair are not easily seen unless the head is examined with a compound microscope. Distant mentions three head spines in his generic description. It is similar in appearance to *U. echinus* Dist., but differs in the shape of the pronotal foveate areas, and in possessing uniseriate areolæ on the costal membrane towards the apex of the elytra.

ESOCAMPYLIA n. gen.

Body elongate-ovate, with strongly impressed punctiform areolæ, the areoles mostly circular.

Head rather large with five depressed forwardly directed spines, the basal pair extend to the base of antennæ, the anterior pair converge and touch between the antennæ, extending to the second segment; antennæ short and moderately stout; segment I cylindrical, slightly stouter and half as long again as the second; III filiform, three times as long as the fourth; IV clavate: bucculæ closed in front, rather wide, cellular, projecting slightly beyond the head, viewed from the side, anteriorly sharply rounded: eyes not prominent. Pronotum slightly convex on disc and strongly depressed behind; tricarinate, the lateral carinæ are weakly developed on the disc, stronger anteriorly and apically bent outwards; sides nearly straight, narrowly carinate anteriorly; collum cellular and slightly raised dorsally; vesicle obsolete, represented by a backward extension of the collum; metasternal orifices not present; the rostrum reaches half-way between the anterior and intermediate coxæ. Elytra a little longer than the abdomen, sides smoothly rounded and narrowed posteriorly; convex, with moderately large punctiform areolæ: the carina bounding the inner side of discoidal area is well developed and extends to the apex of the elytra, the lateral carinæ are absent; the sides are convexly curved, the inner areolæ on the discoidal area are larger than the outer ones, and in some specimens the outer boundary is just discernible as a smooth line. Legs moderately long and stout.

Type.—E. incarinata n. sp.

This genus appears to be allied to *Hesperotingis* Parshley and *Alveotingis* O. & D. It differs from the former in the absence of lateral carinæ to the elytra, and from the latter genus in the structure of the antennæ, and the deflexed costal margin which is not visible from above.

Esocampylia incarinata n. sp.

(Plate XXXII, figure 4.)

General colour yellowish brown.

Head including eyes, two basal antennal segments, a transverse fascia at base of collum, and the coxæ, ferruginous; tarsi, claws, and antennal segment IV., black; antennal segment III and legs, pale testaceous brown; head spines and carinæ whitish testaceous; pronotal disc and the abdomen beneath, reddish brown. Structural characters as in generic description. Length 2·25 mm.; breadth ·75 mm.

Holotype.—Blaekbutt Range, Q., November (H. Hacker). *He. 3363.*

Paratypes.—Sydney, N. S. Wales (A. M. Lea).

Physatochila biseriata n. sp.

(Plate XXXIII, figure 5.)

Head armed with two short adpressed spines basally at sides, a median (generally darker) spine, and two in front, close together, the three latter shorter and semi-erect; antennæ moderately long, subcontiguous at the base. segment II slightly shorter than the first, both short; III long and filiform; IV clavate, slightly pubescent, about as long as the first and seeond eonjoined; bucculæ rather prominent, finely reticulate, closed anteriorly, from side view rectangular in front: the rostrum reaches to the posterior coxæ. Pronotum tricarinate, the anterior margin slightly sinuate, about the same width as the head aeross eyes; vesicle low, areolate, keeled dorsally, from side view slightly convexly curved; paranota biseriate arcolate, adpressed to sides; disc moderately eonvex, finely and closely punctate; posterior angle with somewhat circular areolæ. Elytra ovate, broadest at the middle. smoothly rounded posteriorly; costal membrane biseriate, the outer row somewhat larger than the inner; triseriate in some speeimens opposite the apex of discoidal area; costal area biseriate, diseoidal arca rather large with six rows of areolæ. the outer boundary sinuate; the areolæ in all the areas are rather small and circular.

General colour dull brown. Pronotum, sutural area, and an obseure transverse elytral fascia, fuscous; head ineluding eyes, antennal segment IV, and a nitid spot on each side at base of collum, blaek; pronotal and elytral carinæ, sordid whitish mottled with brown; legs and antennæ testaeeous brown, segments I and II slightly darker than III; underside dark brownish blaek. Length 3·125 mm.; breadth 1·3 mm.

Holotype.—Brookfield, Q., August (H. Haeker). *He. 3364.*

Paratypes.—Same data, and Oetober (H. Hacker).

Physatochila uniseriata n. sp.

(Plate XXXIII, figure 7.)

Head spines similar to those of *P. biseriata*; the antennal segments are also similar; the rostrum reaches to the intermediate eoxæ. Pronotum narrowed and truncate anteriorly, the vesicle obsolete, but collum retieulate and slightly raised, from side view deelivous towards the anterior margin; dise finely punetate; posterior angle reticulated; lateral angles rounded, less prominent than in the previous species; paranota biseriate areolate, adpressed, the arcolæ moderately large. Elytra with strong carinæ bounding areas; costal membranc narrow, uniseriate throughout: costal area biseriate; discoidal area with 5–6 irregular rows of small rounded areolæ.

General colour pale whitish ochraceous with a suffused fuscous fascia across the middle of the elytra occupying all the discoidal area except the extremities, but generally paler centrally; an obscure fuseous streak on each side of the sutural area, extending from base; pronotal carinæ pale at caeh extremity, concolorous on the disc which is oehraceous brown; a nitid spot on each side at the base of eollum, in which the lateral carinæ terminate, head, antennal segment IV and the mesosternum, black; collum, paranota, bueculæ, pale ochraceous; legs, antennæ, and the abdomen beneath brownish ochraecous. Length 3 mm.; breadth 1·125 mm.

Holotype and Allotype.—Mount Lofty Ranges, South Australia (N. B. Tindale). In South Australian Museum.

Paratypes.—Myponga, S.A. (A. H. Elston). Beverley, W.A. (F. H. du Boulay). Melrose, S.A.; Port Lincoln, S.A.: Sydney, N.S.W. (A. M. Lea). *He. 3371.*

The colouration is brighter, and the costal membrane is narrower, than in *P. biseriata.*

Physatochila irregularis n. sp.

(Plate XXXIII, figure 6.)

Head armed with two short adpressed spines basally at sides, a median (generally dark) tubercle-like spine, and two in front close together, the three latter semi-erect; antennæ moderately long, subcontiguous at the base, segment II slightly shorter than the first, both short; III long and filiform; IV elavate, slightly pubescent, about as long as the first and second conjoined: bucculæ rather prominent, finely reticulate, closed, from side view rectangular in front: the rostrum reaches to the intermediate coxæ. Pronotum tricarinate, anteriorly slightly narrower than the width across eyes; pronotal vesicle low, areolate, sharply keeled dorsally, from side view slightly convexly curved above; paranota two rows reticulate, adpressed to sides: disc moderately convex, finely and closely punctate: posterior angle with small circular areolæ. Elytra ovate, broadest at the middle: costal membrane mostly biseriate, uniseriate at the middle, with moderate sized areolæ, costal area biseriate; discoidal area rather large with about seven irregular rows of small punctiform areolæ at the widest part; wings almost as long as the elytra.

General colour brownish testaceous. Head, base of collum triangularly on each side, mesosternum and antennal segment IV except the extreme base, black; head spines, pronotal vesicle, and the posterior angle, flavous; disc brownish or reddish yellow, pronotal carinæ concolorous: abdomen beneath and the legs ochraceous brown. Length 3·25 mm.; breadth 1·375 mm.

Holotype.—Stanthorpe, Queensland, January (H. Hacker). *He. 3365.*

Paratypes.—Same data.

Differing chiefly from the two previous species in the absence of a transverse elytral fascia; also a slightly more developed pronotal vesicle and the costal membrane biseriate, uniseriate in the middle.

Tingis (Tingis) drakei n. sp.

(Plate XXXIII, figure 8.)

Ovate, moderately broad, glabrous.

Head armed with five porrect spines, two basally at sides, each as long as an eye, a shorter medial spine and two in front converging between antennæ, reaching half the length of the first segment: antenniferous tubercles somewhat prominent, rounded: antennal segment I stouter and half as long again as II: III filiform three and a-half times the length of fourth: IV pilose and slightly swollen: the rostrum reaches to the intermediate coxæ. Pronotum with fine dense punctures: disc moderately convex, tricarinate, the median carina percurrent, slightly more elevated, uniseriate areolate; collum rather long, wider than the head, the anterior margin bisinuate; hood small, areolate, viewed laterally almost straight above, projecting in the middle over the base of head: paranota prominent at anterior angles, ampliate

in front, somewhat recurved behind, biseriate areolate, the outer margin almost straight, rounded posteriorly; posterior angle rather long, acutely pointed, areolate. Elytra much longer than the abdomen, convexly curved anteriorly, widest before the middle, concavely sinuate beyond and rounded posteriorly; costal membrane wide, composed of three rows of large somewhat irregular areolæ, posteriorly reduced to one row: costal area declivous, with three rows of small areolæ; discoidal area widest at the middle with about eight rows of moderately small areolæ; sutural area with large areolæ over the greater part, becoming smaller towards the base.

General colour pale luteous; hood, paranota, head spines, and bucculæ creamy white; antennæ except segment IV, legs, and abdomen, testaceous; antennal segment IV except basally, metasternum and the tip of rostrum, black; a spot on median carina in the centre of disc, a few transverse lines on costal membrane, a diffuse spot at apex of sutural area, and a few fine irregular lines on the posterior angle, discoidal and sutural areas, brown. Eyes ruby. Length 3·375 mm.; breadth 1·375 mm.

Holotype.—South Pine River, January (H. Hacker). *Hc. 3366.*

Paratypes.—Nanango District, March; Mount Mee, September; Gold Creek, November; Mt. Tambourine, January; South Pine River, October (H. Hacker). Mt. Tambourine (A. M. Lea).

This species is dedicated to Carl J. Drake, who kindly indicated to me the genus to which it is assigned.

Tingis (Tingis) angulata n. sp.

(Plate XXXIV, figure 9.)

Head armed with five slender spines; two basally at sides curving downward, two anteriorly porrect and contiguous, extending between the antennæ, and one medially semi-erect; antennæ moderately long, slender, segment I slightly longer and stouter than II, both cylindrical; III slender, filiform: IV swollen towards apex, as long as I and II conjoined; bucculæ rather wide, cellular, apically somewhat angular and prominent. Pronotum strongly convex and finely cellular on disc, tricarinate, the carinæ uniseriate, more strongly raised on the disc where they are biseriate areolate: collum rather deep, cellular; anterior vesicle very slightly developed, truncate in front, with a dorsal erect spine on each side of the median carina; paranota narrow anteriorly, with a lateral slender spine; wider and biseriate behind with two long spines, one anterior and one posterior to the lateral angles; posterior angle acute and reticulated. Elytra longer than the abdomen, lateral margins with several slight angular projections; costal membrane uniseriate, the areolæ rather large, mostly tetragonal, sometimes a few double cells opposite the apex of discoidal area; the areolæ on elytral areas are about the same size, but are larger towards the apex of the sutural area.

General colour whitish ochraceous: a spot on the carina in the middle of disc: a fascia about middle of elytra darker at sides, wider and paler on discoidal area; a suffusion on sutural area, and on posterior angle of pronotum, brown; head, rostrum, mesosternum, and coxæ, testaceous-brown; eyes, antennal segment IV, and tarsi, black; antennal segments I, II, III, legs, and body beneath, flavo-testaceous; apex of the bucculæ and the wings, dusky. Length 2·25 mm; breadth ·625 mm.

Holotype.—Upper Brookfield, Q., March (H. Hacker). *Hc. 3367.*

This species closely resembles *T. spinicollis* Horv. in the structure of the head and paranotal spines, also in colour. It differs, however, in the angulations on the lateral margins of the elytra. These vary somewhat in development; in some specimens they are just discernible, while in others they are very distinct and spinose.

Tingis (Tingis) insularis n. sp.

(Plate XXXIV, figure 10.)

Very similar in general appearance to *T. angulata*, but differing in the following respects:—Costal membrane wider with two rows of areolæ; lateral margins of elytra and the carinæ, minutely dentieulated, the dentieules bearing a fine hair; femora and tibiæ furnished with scattered ereet hairs; the three paranotal spines are all anterior to the lateral angles. Colours similar to *T. angulata*, but the transverse faseia and other brown markings are generally paler and less defined. Length 2·625 mm.; breadth 1 mm.

Holotype.—Dunk Island, N.Q., August (F. A. Perkins). *He. 3368.*

RADINACANTHA n. gen.

Elongate-ovate, with long and slender legs and antennæ.

Head nearly as long as wide, convex above, with five long slender spines; the four outer ones direeted upwards and outwards, the eentral spine is nearly perpendicular; bueeulæ prominent, extending beyond head, rounded and closed in front, reticulated; antennæ long and slender, segments I and II moderately stout, cylindrical, the second a little shorter than the first; III very long, filiform; IV longer than the first and second conjoined, slightly swollen towards apex, and elothed with a few fine hairs; rostrum short, reaehing barely halfway between the first and second pair of eoxæ. Pronotum with one central carina, which is pereurrent; disc strongly eonvex, eoarsely punctured, nitid; hood absent; eollum deep, slightly raised anteriorly; paranota narrow anteriorly, obsolete posteriorly; posterior angle depressed and reticulated; rostral sulcus open behind; odoriferous orifice present. Elytra narrow, mueh longer than the abdomen, sides slightly sinuate; eostal membrane uniseriate, areolæ tetragonal, large; costal area uniseriate, areolæ also tetragonal, increasing in size posteriorly; the discoidal area extends half the length of the elytra, and is widest before the middle, with five-six rows of small subcireular areolæ. Legs very long and slender, femora slender basally, slightly swollen towards the apex.

Type.—R. reticulata n. sp.

This genus is chiefly distinguished by its outwardly direeted head spines, single pronotal earina, uniseriate costal membranc, and eostal area.

Radinacantha reticulata n. sp.

(Plate XXXIV, figure 11.)

Head sparsely punctured, nitid, armed with five long slender spines, the four outer ones extending outwardly beyond the sides of the head. Pronotum with distinet uniseriate paranota, whieh are eonvexly curved from the base of the eollum and disappear at about the middle of the lateral margins; the pronotal earina is also uniseriate, areolate.

Head including eyes, antennal segment IV, tarsi, mesosternum, and abdomen, black; pronotal disc, castaneous, with a darker, nitid, transverse fascia anteriorly; antennæ excepting segment IV, head spines, pronotal carina, legs, reticulations on the elytra, and posterior angle of pronotum, flavous; elytral membrane hyaline, irideseent; paranota, anterior margin of collum, and the rostral sulcus, white; buceulæ brownish. Length 3 mm.; breadth 1 mm.

Holotype.—Samsonvale, Q., April (H. Haeker). *He. 3369.*

Paratypes.—Same data, and August, September; Bribie Island, January (H. Haeker).

Radinacantha tasmanica n. sp.

(Plate XXXIV, figure 12.)

Head somewhat globular above, armed with five spines which do not extend outwards beyond the sides of head; the pronotal carina is less elevated than in *R. reticulata*, and the paranota are obsolete. represented by a short linear carina anteriorly; the tibiæ are apieally blackish, and the head spines are basally black; in other characters and in size, this speeies is similar to the preeeding one.

Holotype.—Strahan, Tasmania (Lea and Carter). In South Australian Museum.

Paratype.—Same data. *He.* 3370.

Leptobyrsa magnifica n. sp.

(Plate XXXV, figure 13.)

Head smooth, armed with five long slender spines; two basally at the sides sub-parallel; three in front converging between the antennæ and projecting slightly beyond the first segment; antennæ moderately long, clothed with rather long fine hairs; segment I cylindrical, twice as long as the second; III slightly more than twice the length of the fourth; IV slender, longer than the first and second segments conjoined; the rostrum extends to the posterior coxæ. Pronotum finely punctured, tricarinate, the median carina is arcuately elevated, with a row of very large transverse areolæ; vesicle high, longer than wide, with large reticulations; from side view the anterior margin is straight, inclining obliquely over the head; the top of the vesicle is strongly arcuate; posterior angle short, broadly rounded behind, leaving a triangular area exposed between the elytra; paranota very broad and furnished with a row of small marginal spines; the anterior margin is sinuate and roundly produced beyond the head; the sides are convexly curved and extend to behind the lateral angles; they contain five irregular rows of areolæ which increase in size towards the outer margin. Elytra very broad and furnished with a row of small marginal spines; the areolæ are large, convex, and iridescent; tumid elevation well developed; the discoidal area is wide, convex on the outer side and centrally depressed towards the inner side; the costal area is strongly sinuate.

General colour pale flavous; head and pronotum, testaceous brown, the punctures slightly darker; a spot in the centre of discoidal areas and at the base of sutural area; a suffusion on the elytra posteriorly, following the costal area, becoming wider apically, fuscous; the reticulations over these spots are blackish; eyes and abdomen, black; legs, head spines, and the antennæ, pale flavous, exeepting the apical third of segment IV, which is fuscous. Length 4 mm.; breadth 3 mm.

Holotype.—Mt. Tambourine, Q., January (H. Hacker). *He. 3372.*

Paratypes.—Mt. Tambourine, November, January; Brookfield, November, March; Nanango District, November (H. Hacker).

Leptobyrsa major n. sp.

(Plate XXXV, figure 14.)

Similar in shape to *L. magnifica*, but larger and without any fuscous markings.

Head spines and antennæ as in *L. magnifica*: the rostrum reaches to the intermediate coxæ. Pronotum very finely punctured and thinly pilose; the median carina is foliaceous, with large oblong areolæ; paranota very large, broadly rounded anteriorly, with seven rows of areolæ, which are small near the base, increasing in size towards the margin. Elytra more widely rounded at the sides and posteriorly, than in *L. magnifica*; the areolæ are also more numerous and slightly smaller; discoidal area very wide, swollen towards the outer margin, with a small transverse depression at about the middle; costal membrane with a few transverse rows of reticulations slightly stouter than the others, forming horizontal lines: the membrane between the reticulations is convex, hyaline, and iridescent.

General colour pale ochraceous; eyes, antennal segment IV except basally, claws, and mesosternum, black; abdomen beneath brown, becoming paler apically; pronotum tawny; reticulations on pronotum and elytra whitish ochraceous, with some slightly darker on vesicle, margins of paranota and centre of the discoidal area; legs and antennæ, flavous. Length 5 mm.; breadth 3·875 mm.

Holotype.—Blackbutt, Queensland, November (H. Hacker). Unique. *He. 3373.*

Furcilliger tricolor n. sp.

(Text-figure 1.)

Head armed with five spines, the basal pair longest, appressed to head and curving inwardly: the central spine semi-erect, and the anterior pair porrect, in close contact, between the antennæ; buccnlæ closed and from side view, angular in front; the rostrum reaches to the intermediate coxæ; antennal segment I short and cylindrical; II slightly shorter than the first; III long and filiform, three times longer than the fourth. Pronotum in front about the same width as head, the anterior margin slightly sinuate and touching the base of eyes; pronotal vesicle small and coarsely reticulated, nearly vertical in front and horizontal above, transversely ridged anteriorly, with a small tubercle at each end; paranota very large, rugose, covering most of the disc, composed of large deeply impressed areolæ, the reticulations coarse and uneven; they are elevated and longitudinally ridged on each side of the disc, appearing, when viewed from the front, as two pyramidal elevations, higher than the median carina which is uniseriate, and lies between them; the lateral carinæ are uniseriate, widely separated on the posterior angle, converging towards the disc where they are apposed to the margins of the paranota; posterior angle reticulate and acutely pointed. Elytra broad, flat, and extending beyond the abdomen; moderately ampliated from base to middle, then slightly narrowed, apex widely rounded; the areas are sharply defined; costal membrane biseriate, areolæ large, the outer row slightly larger than the inner; costal area declivous, biseriate, not widened or angulate at the apex of discoidal area, areolæ small.

Text-figure 1.

Photo., H. Hacker.

Colours white, testaceous, and brown. Lateral carinæ posteriorly, some reticulations on pronotum anteriorly, costal membrane and carinæ at the base of elytra and at the apex of discoidal area, white or pale testaceous; a transverse median fascia on the elytra, narrow at sides, widening towards the middle including most of the discoidal area, and a spot on each side near apex of elytra, fuscous; sutural area fulvous, darker basally: antennal segments I and IV, and the head spines, testaceous-brown; segments II and III, and the legs, testaceous; head, mesosternum, and the abdomen beneath, dark ferruginous. Length 2·625 mm.; breadth 1·125 mm.

Holotype.—Mount Glorious, Queensland, March (H. Hacker). *He. 3374.*

Paratypes.—Upper Brookfield, March; Mount Tambourine, January (H. Hacker).

The above species agrees fairly well with the generic characters; the forked teeth on vesicle are here represented by minute spine-like tubercles, and the minute teeth on elytra, mentioned by Horvath, are absent. These may prove later to have only specific value. *F. tricolor* also differs from *F. asperulus* Horv., in possessing more prominent pronotal angles, and pale-brown apical antennal segment.

Sinalda tindalei (Hacker).

Phatnoma tindalei Hacker, Mem. Queensl. Mus. ix, pt. ii, p. 177, 1928.

In the description of this species, I noted its resemblance to *P. æthiops* Dist. and *P. testacea* Dist. In a paper by Distant* which I have recently obtained, he has placed these species in a new genus *Sinalda*. I here transfer my species also, as it agrees

* Trans. South Afr. Phil. Soc. xiv, p. 426, 1903-4.

with the characters given by Distant, i.e., "Allied to *Phatnoma* by the raised transverse lines to the discoidal and subcostal areas of the elytra, but differing by the non-dilated lateral areas of the pronotum, which are more or less convex, not spinously ampliated; the elytra are also relatively narrower."

Calotingis subopaca (Haeker).

Neopachycysta subopaca Haeker, Mem. Queensl. Mus. ix, pt. ii, p. 183, 1928.

Dr. Carl J. Drake drew my attention to this synonymy and kindly forwarded a copy of his genus *Calotingis* which I did not possess.

Lasiacantha leai (Haeker).

Myrmecotingis leai Haeker, Mem. Queensl. Mus. ix, pt. ii, p. 182, 1928.

I am also indebted to Dr. Drake for pointing out this synonymy, with which I concur.

EXPLANATION OF PLATES.

All the figures are enlarged sixteen diameters.

PLATE XXXII.

Fig. 1.—*Cantacader nocturnis* n. sp.
Fig. 2.—*Tigava unicarinata* n. sp.
Fig. 3.—*Urentius sarinæ* n. sp.
Fig. 4.—*Esocampylia incarinata* n.g. et sp.

PLATE XXXIII.

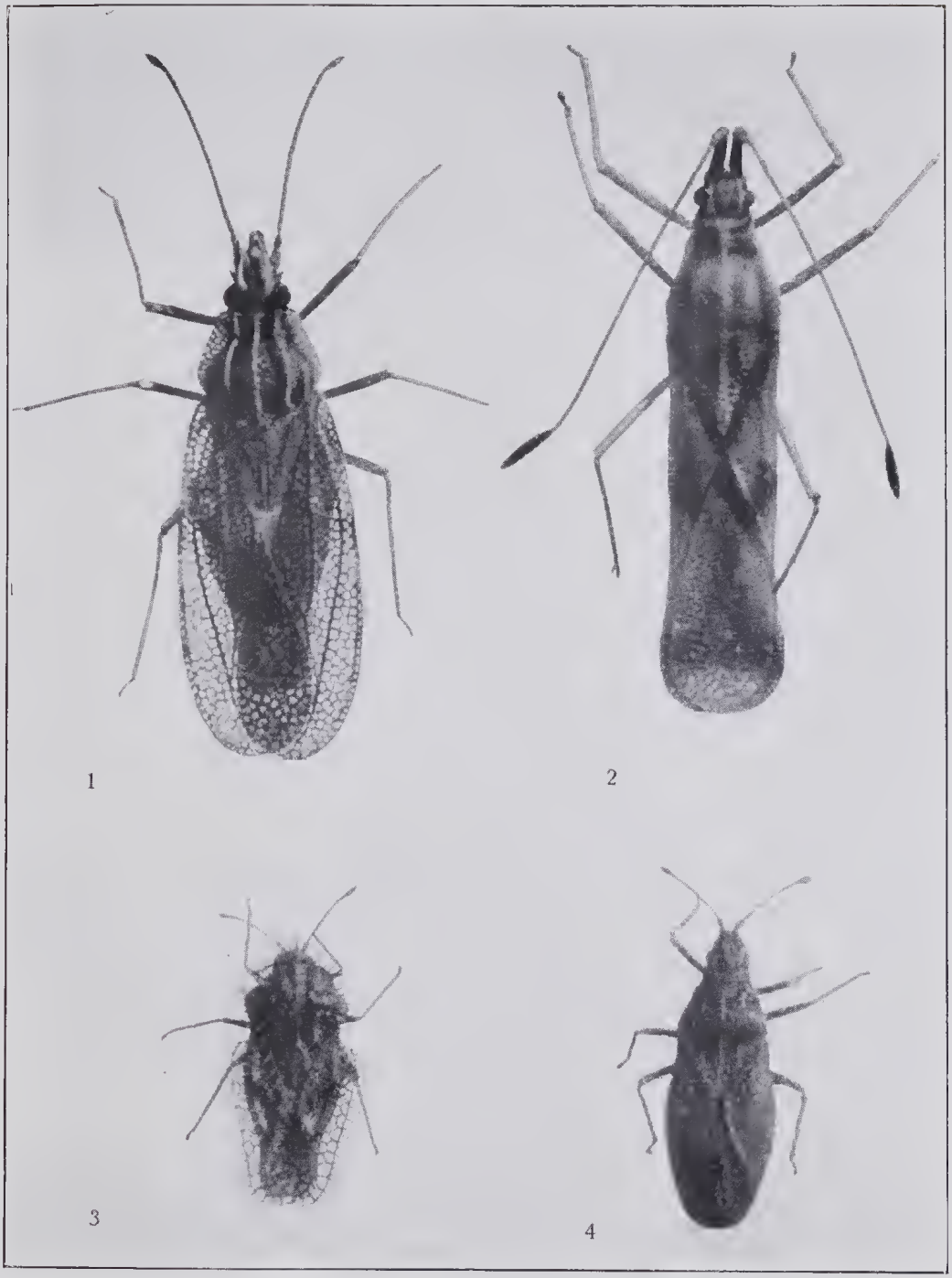
Fig. 5.—*Physatochila biseriata* n. sp.
Fig. 6.—*Physatochila irregularis* n. sp.
Fig. 7.—*Physatochila uniseriata* n. sp.
Fig. 8.—*Tingis* (*Tingis*) *drakei* n. sp.

PLATE XXXIV.

Fig. 9.—*Tingis* (*Tingis*) *angulata* n. sp.
Fig. 10.—*Tingis* (*Tingis*) *insularis* n. sp.
Fig. 11.—*Radinacantha reticulata* n.g. et sp.
Fig. 12.—*Radinacantha tasmanica* n. sp.

PLATE XXXV

Fig. 13.—*Leptobyrsa magnifica* n. sp.
Fig. 14.—*Leptobyrsa major* n. sp.



Australian Tingitidæ.

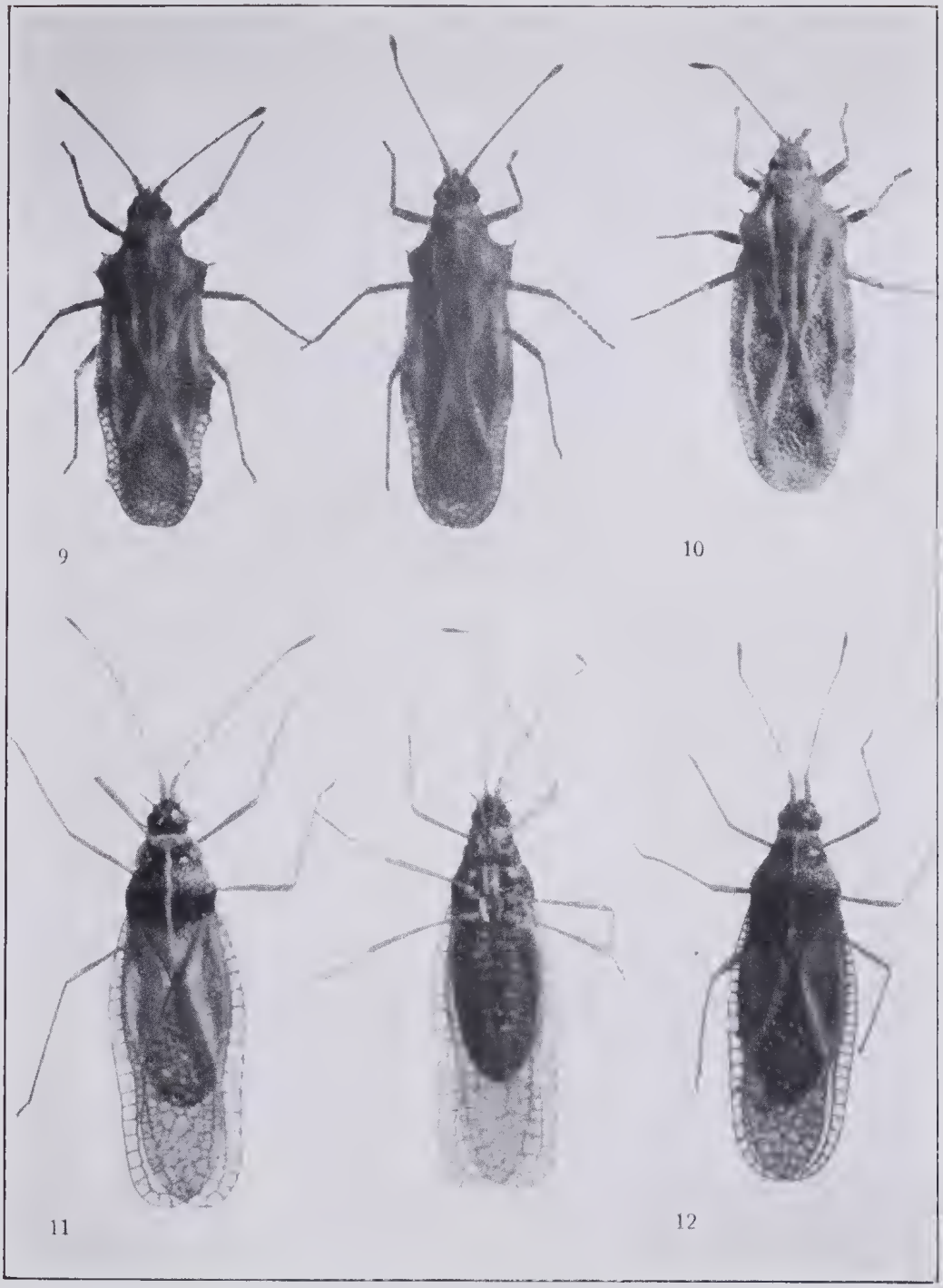
Photos., H. Hacker.

Face page 334.

Australian Tingitidæ.

Photos., H. Hacker.

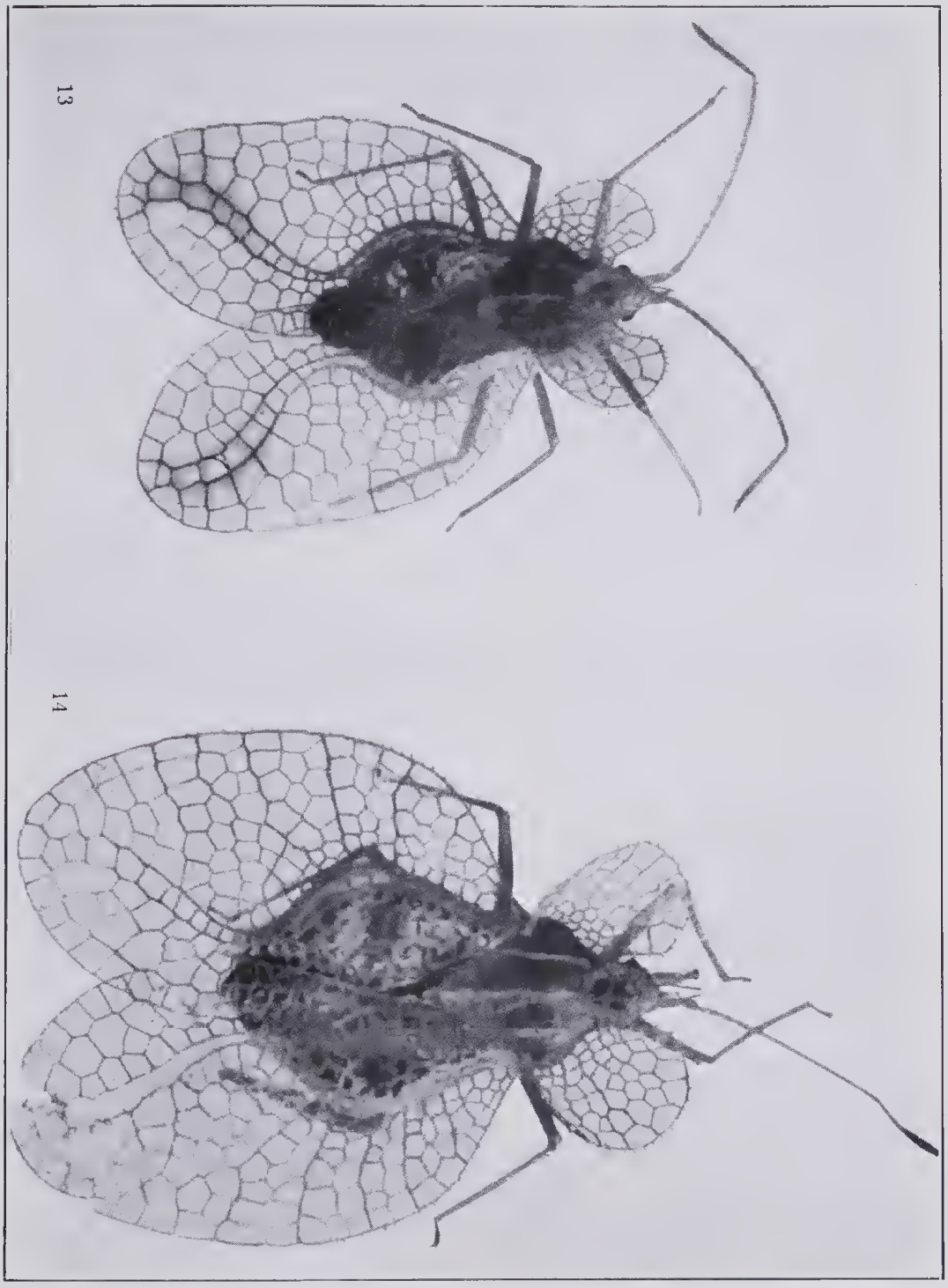
Face page 334.



Australian Tingitidæ.

Photos., H. Hacker.

Face page 334.



Australian Tingitidæ.

Photos., H. Hacker.

Face page 334.

On COLEOPTERA, mostly from Queensland.

(Part II.)[1]

By Arthur M. Lea, F.E.S.

(Contribution from South Australian Museum).

Mr. Hacker, the Entomologist of the Queensland Museum, has recently collected in the National Park of Queensland (several other entomologists have also collected there), and from the mass of material taken it is evident that this is one of the richest places in Australia for insects. This is very fortunate on account of the immense clearings of forests that have occurred in the coastal districts of Queensland and northern New South Wales.

MALACODERMIDÆ.

Metriorrhynchus connexus n. sp.

♂. Black, sides of prothorax and elytra (except for a large discal blotch) reddish testaceous.

Rostrum absent. Antennæ long, extending to about the middle of the elytral blotch, rather strongly serrated, third joint slightly longer than fourth, the others very feebly decreasing in length, but eleventh about as long as third. Prothorax five-areolate, moderately transverse, hind angles acutely triangular. Elytra narrow, sides almost parallel to near apex; with irregular single rows of punctures on most of the surface, becoming double on basal fifth on each side and about the tips. Abdominal notch deep. Length, 7·0–7·5 mm.

♀. Differs in having the antennæ shorter and less strongly serrated, elytra not quite so parallel-sided and abdomen not notched.

Queensland: National Park in December (H. Hacker). Types, in Queensland Museum.

An unusually interesting species. The elytral punctures are in irregular single series for most of their extent, but are in double series in places. Regarding them as in single series, the postmedian blotch on the elytra readily distinguishes the species from all previously described ones; this blotch also distinguishes from all the species in which the pronotum is five-areolate. The median areolet of the prothorax extends almost to the apex, and the latero-apical ones are sharply defined by their carinæ. The black part of the prothorax is complete from base to apex, with the pale portion on each side wider at the base than apex; on the elytra the blotch is postmedian and extends to about one-fifth from the apex and to about one-third (of each elytron) from the sides; it differs slightly on the two specimens.

Metriorrhynchus filirostris n. sp.

♀. Black, prothorax, elytra, and sides of scutellum reddish testaceous.

Rostrum thin and slightly longer than prothorax. Antennæ moderately long and serrated, third joint rather long, slightly longer than eleventh, and

[1] Part I. in Memoirs Qld. Museum, VII, pt. iii, 4th Novr., 1921.

distinctly longer than fourth, the others feebly decreasing in length. Prothorax moderately transverse, sides almost evenly increasing in width to base, hind angles acute; regularly seven-areolate. Elytra thin, parallel-sided; with regular double rows of punctures, the alternate interstices distinctly elevated. Length, 10 mm.

Queensland: Cairns district (F. P. Dodd). Type (unique), in South Australian Museum.

The rostrum is decidedly longer and thinner than on *M. nigripes*, *textilis*, *uniformis*, *ramicornis*, and *sculpticollis*, being much as on many specimens of *M. rhipidius*, and slightly longer than the prothorax.

Metriorrhynchus decipiens n. sp.

♂. Black, sides of prothorax and most of elytra reddish testaceous.

Rostrum moderately long, but, excluding the lips, not quite as long as wide; antennæ moderately long, strongly serrated or subpectinated, third joint distinctly longer than fourth and slightly longer than eleventh. Prothorax moderately transverse, sides dilated and elevated to base, regularly seven-areolate. Elytra narrow, parallel-sided to near apex; with regular double rows of transverse or subquadrate punctures, alternate interstices moderately elevated. Abdomen deeply notched. Length, 11 12 mm.

♀. Differs in having antennæ somewhat shorter and less strongly serrated and abdomen not notched.

Queensland: National Park in December. New South Wales: Tooloom in January (H. Hacker). Type, in Queensland Museum; cotype, in South Australian Museum.

The rostrum is not quite as long as on *M. variipennis*, and the sides of the prothorax are more evenly dilated to the base. Less of the elytra are black than on *M. ordinarius*, and the rostrum is distinctly shorter. At first glance the species appears to belong to *M. medioniger*, but the prothorax has the sides more dilated to the base and the rostrum is distinctly longer; that species belongs to a section of the genus in which the rostrum is very short or absent. The moderately long rostrum is much as on *M. irregularis*, but the size is larger and the elytra are partly black. About the median half of the prothorax is black, on the elytra the black part extends across three rows of puncture on each side of the suture at the base, but is narrowed and terminates at the basal third. The tips of the abdominal segments are very narrowly pale, but the pale parts could be easily overlooked. The specimen from Tooloom has the black part of the elytra extending almost across the entire base, and continued to well beyond the middle, but with the black part of the ridges terminated before that of the depressed parts.

Metriorrhynchus pertenuis n. sp.

♂. Blackish, sides and apex of prothorax, elytra, base of front and of middle femora and the coxæ flavo-testaceous.

Rostrum moderately long, including the lips slightly longer than wide. Antennæ rather long and strongly serrated, third joint slightly longer than fourth, the eleventh very little longer than tenth. Prothorax about as long as the basal width, which is decidedly more than that of apex, sides almost parallel on apical half, triangularly dilated posteriorly; regularly seven-areolate. Elytra very narrow;

with regular double rows of punctures over most of the surface, but on parts of the inner half with irregular single rows, the alternate interstices moderately elevated above the others. Abdomen deeply notched. Length, 6–9 mm.

♀. Differs in having the antennæ shorter and less strongly serrated, and abdomen not notched.

Queensland: Cairns district (F. P. Dodd). Type, in South Australian Museum; cotype, in Queensland Museum.

An unusually narrow species, the prothorax with or without a black or infuscate patch touching neither the apex nor sides, but (when present) usually touching the base. There is occasionally a slight infuscation about the scutellum, the three basal joints of the antennæ are sometimes partly pale, especially on the under surface. The rostrum is distinct but not long.

Metriorrhynchus insignipes n. sp.

♂. Black, prothorax (a mediobasal blotch excepted) and elytra brick-red.

Rostrum about as long as wide, but, excluding the lips, somewhat transverse. Antennæ moderately long, not very strongly serrated, with rather long pubescence inwardly. Prothorax in middle almost as long as the greatest width, middle angularly produced, sides parallel to about middle, then dilated and elevated, and then narrowed to base; regularly seven-areolate. Elytra parallel-sided to near apex; with regular double rows of punctures, the alternate interstices moderately elevated. Abdomen deeply notched. Hind tibiæ wide, each with a wide notched flange, commencing about the middle and extending almost to level with the apex. Length, 9–10 mm.

♀. Differs in having the antennæ somewhat shorter and less serrated, their clothing short, abdomen not notched, and hind tibiæ simple.

New South Wales: Howell (J. F. Stephen). Type, in Lea collection.

The projection on the hind tibia is a compound one and nearer the apex than base; it is somewhat similar (although not exactly the same) to that on *M. tibialis*, but the species is a larger one, and the elytra are entirely reddish. The blotch on the pronotum is confined to the mediobasal areolet and to not quite half of each of the laterobasal ones.

Metriorrhynchus hackeri n. sp.

♂. Black, sides of prothorax and elytra brick-red.

Rostrum short, moderately transverse if lips included, strongly transverse without them. Antennæ rather long, strongly serrated or subpectinated. Prothorax moderately transverse, front somewhat produced and slightly notched in middle, sides subparallel to middle, then obliquely dilated and elevated and then almost parallel to base; regularly seven-areolate. Elytra with sides feebly dilated from beyond middle to near apex: with regular double rows of square punctures, the alternate interstices moderately elevated. Abdomen deeply notched Hind tibiæ with a thin, flat, truncated flange, commencing near the base and diverging at an angle of about 15 degrees. Length, 10–11 mm.

♀. Differs in having antennæ shorter and less strongly serrated, abdomen not notched, and hind tibiæ simple.

Queensland: National Park, in December (H. Hacker). Type, in Queensland Museum; cotype, in South Australian Museum.

Another species with remarkable hind tibiæ in the male. On the preceding one the flap is considerably wider, notched at its apex and commences nearer the apex. On *M. tibialis* the projection is partly free and commences nearer the base than apex, but is more median and of different shape; that species is also considerably smaller, and has the elytra widely tipped with black. On *M. dentipes* (which differs considerably in colours also) the projection on the hind tibiæ is nearer the apex than base, and is a dilated part of the lower surface; on the present species it is a flap, and is nearer the base than the apex. Of the species with simple hind tibiæ in the male which resemble it in colour, *M. lateralis* has a long rostrum, *M. variipennis* and *cryptoleucus* are wider, with the rostrum longer, and *M. irregularis* has a somewhat longer rostrum.

The great superficial resemblances between many species of *Metriorrhynchus*, and allied genera, render it desirable that every specimen should be critically examined. I know of no other subfamily of beetles in which species may be readily separated by profound differences of sculpture and which yet so strongly resemble each other that they could be easily misidentified.

Metriorrhynchus mollicollis n. sp.

♂. Black, elytra brick-red.

Rostrum absent. Antennæ rather long, joints pectinate or subramose. Prothorax distinctly transverse, sides almost parallel throughout; regularly seven-areolate. Elytra narrow, parallel-sided to near apex; with regular double rows of punctures, the alternate interstices moderately elevated. Abdomen with a deep notch. Length, 10–11 mm.

Queensland: National Park, in December (H. Hacker). New South Wales: Jenolan (J. C. Wiburd). Type, in Queensland Museum; cotype, in South Australian Museum.

Strikingly close in appearance to the typical form of *M. rufipennis*. The specimen from Jenolan has been known to me for many years, and there is another, from the Upper Williams River, in the collection of Mr. F. Erasmus Wilson; I previously considered they were possibly aberrant specimens of *rufipennis*, but the examination of four fresh specimens, taken by Mr. Hacker, renders it certain that the species is a distinct one. It differs from that species in having the produced parts of the antennæ longer (these by themselves would not be conclusive, and the Jenolan specimen has them shorter than the others), the rostrum even shorter (practically absent) but in particular by the prothorax; this has a velvety appearance, is distinctly shorter, more parallel-sided, and the hind angles almost rectangular, the mediofrontal areolets are wider, and the mediobasal one less dilated at its apical third. The produced parts of the third and tenth joints of the antennæ of the Queensland specimen are slightly shorter than the outer edge of their supporting joints, but on the fourth to ninth they are longer, the eleventh joint is about twice the length of the outer edge of the tenth.

Metriorrhynchus longicollis n. sp.

♂. Black, basal two-thirds or three-fourths of elytra brick-red.

Rostrum extremely short (practically absent). Antennæ rather long, third-tenth joints pectinate, produced part of third shorter than its support, of fourth

and tenth about as long, of the intervening ones longer. Prothorax, along middle, slightly longer than wide, apex triangularly produced, sides slightly notched at basal third ; seven-areolate, the frontal areolets granulate-punctate. Elytra narrow, parallel-sided to near apex , with double rows of punctures mostly even, the alternate interstices elevated. Abdomen deeply notched. Length, 7–10 mm.

♀. Differs in having the antennæ strongly serrated only, and abdomen not notched.

Queensland : National Park, in December (H. Hacker). Type, in Queensland Museum ; cotype, in South Australian Museum.

Of the three frontal carinæ on the pronotum the median one is continuous to the apex, the others terminate some distance before it, except that the one on the right, on one specimen only, is continuous. On *M. brisbanensis* and *togatus* (which it greatly resembles) the prothorax is more transverse, not conspicuously produced in the middle, the carinæ completely margin the areolets, and the antennæ of the male are strongly serrated only. *M. batesi* is a much larger species, with very different prothorax. A line drawn across the prothorax, connecting the front of the sides, would cut off a triangle rather more than one-third the length (along the middle) of the segment.

Metriorrhynchus pectinicornis n. sp.

♂. Black or blackish and pale brick-red.

Rostrum very short (practically absent). Antennæ moderately long, strongly pectinated. Prothorax moderately transverse, apex widely triangularly produced, sides slightly notched in middle, hind angles slightly produced outwards, regularly seven-areolate, except that the submedian costæ are not quite continuous to apex. Elytra narrow ; with regular double rows of punctures, the alternate interstices moderately elevated. Abdomen deeply notched. Length, 8·5–9·5 mm.

Queensland : Meringa, in January (F. H. Taylor). Type, in National Museum ; cotype, in South Australian Museum.

In general appearance like *M. posticalis*, and some specimens of *M. cinctus*, but all prothoracic areolets well defined, alternate interstices of elytra more conspicuously elevated, and not quite so much of apex black. The antennæ are very different from those of the males of *M. crassipes*, *trichocerus*, and *eucerus* ; the rostrum is much longer on *M. apicalis*, *abdominalis*, *melaspis*, and *dentipes*. *M. compositus* has strongly serrated antennæ in the male (the only sex known), but not pectinated. On the type the pale parts are the prothorax, scutellum, basal four-fifths of elytra, sterna, coxæ, and basal third of femora ; on the second specimen the metasternum is deeply infuscated, but elsewhere the colours are the same. On the type the produced parts of the third and tenth joints of antennæ are slightly longer than their supports, on the intervening joints they are much longer, on several of them almost twice as long ; on the second specimen they are shorter, although decidedly pectinate.

A specimen from North Australia (Groote Eylandt, N. B. Tindale) is much as the second specimen from Queensland, but is less brightly coloured, and a greater portion of each femur is dark.

Metriorrhynchus semiflavus n. sp.

♂. Black, prothorax, scutellum, basal third of elytra, coxæ, trochanters, prosternum, and mesosternum flavous.

Rostrum absent. Antennæ strongly serrated or subpectinated. Prothorax moderately transverse, sides notched in middle and strongly triangularly dilated to base; regularly seven-areolate. Elytra narrow, parallel-sided to near apex; with regular double rows of punctures, the alternate interstices moderately elevated on basal half, very feebly elevated posteriorly. Abdomen deeply notched. Length, 8 mm.

Queensland: Kuranda (F. P. Dodd). Type (unique), in South Australian Museum.

Of the shades of colour of some specimens of *M. longicornis*, but pale portion of elytra longer and scutellum pale, the alternate interstices of elytra are also less strongly elevated, posteriorly being scarcely different from the others. It is strikingly like *M. ampliatus* and *Trichalus semiatratus*; the former has very different prothoracic areolets, and the latter differs in generic features.

Metriorrhynchus uniseriatus Lea.

Mr. Hacker has taken, in the National Park of Queensland, some specimens that are considerably larger than usual (up to 11 mm.)

Metriorrhynchus mimicus Lea.

A specimen from Apollo Bay in the National Museum evidently belongs to this species, but differs from the type in having the elytral margins red almost to the base, and the red curved round the suture for a short distance, but the tips (except for the margins) not reddish.

Metriorrhynchus crassipes Lea.

Six specimens of this species were recently taken on Groote Eylandt: the female differs from the male in having the antennæ distinctly shorter and less serrated and the abdomen not notched. The pale portion of the abdomen is variable: sometimes two segments only are pale, sometimes three, or two and part of a third: at first glance the pale segments are suggestive of the phosphorescent parts of fireflies (*Luciola* spp.).

Trichalus metasternalis n. sp.

♂. Black and flavous.

Rostrum absent. Antennæ slightly passing flavous part of elytra; third joint suboblong, fourth-tenth moderately serrated, eleventh narrowly elliptic, slightly longer than tenth. Prothorax distinctly transverse, base (except that the hind angles are produced outwards) very little wider than apex; triareolate, the median areolet narrow and continued to apical fourth. Elytra narrow, parallel-sided to near apex; subsutural costa trifurcate near base, elsewhere with regular double rows of punctures, the alternate interstices moderately elevated. Abdominal notch deep. Length, 6–8 mm.

♀. Differs in having the antennæ shorter and less serrated, and abdomen not notched.

North Australia : Darwin (G. F. Hill). Type, in South Australian Museum ; ectype, in Queensland Museum.

The prothorax is more transverse than on *T. placidus*, and the antennæ are shorter and more of apex of elytra is dark. The hind angles of prothorax, distinctly although not strongly produced outwards, distinguish from *T. sulcatus* ; rather more of apex of elytra is black, and the metasternum and legs vary somewhat in colour (as they also do on *sulcatus*). The flavous parts are the prothorax, scutellum, basal three-fifths of elytra, prosternum, mesosternum, coxæ, and base of femora. Of four females three have the under parts coloured as on the male, on the other the metasternum is deeply infuscated.

Two females, from Groote Eylandt (N. B. Tindale), differ from the others in having the hind angles of the prothorax more produced outwards ; one of them has the metasternum flavous, on the other it is deeply infuscated.

Trichalus sulcatus Waterh.

Three specimens, from North Australia (Darwin and Melville Island), apparently belong to this species, but have the femora entirely pale (except that their tips are slightly infuscated) and tibiæ partly pale. On one of them the under surface is pale, except that the tip of the abdomen is infuscated. On another the two basal segments only are infuscated at their tips ; these two specimens also have the three basal joints of antennæ entirely pale and parts of the following joints. On Queensland specimens of *T. sulcatus*, however, the under surface and legs vary in colour. On the third specimen the abdomen is blackish, except that the four basal segments are pale on each side.

Heteromastix irregularis n. sp.

♂. Flavous ; head, fourth to eleventh joints of antennæ and most of third, scutellum, apical fourth of elytra, metasternum, abdomen, and tarsi black or infuscated.

Head shallowly depressed between eyes. Third joint of antennæ about as long as first, but much wider, produced on one side of apex, fourth longer and slightly wider than third and also produced on one side of apex, fifth about as long as fourth but narrower, dilated on one side of middle, the following joints narrow, cylindrical, and slightly decreasing in length, but the eleventh slightly longer than tenth. Prothorax at base about once and one-half as wide as the median length, sides evenly elevated and rounded ; without distinct punctures. Elytra about as wide as the widest part of prothorax ; with dense and small, rugulose punctures. Abdominal notch distinct. Front tibiæ with a small notch and spine at the inner apex, basal joint of front tarsi with an inner notch or curve. Length, 4·5–5·0 mm.

♀. Differs in having the head smaller and gently convex between eyes ; and antennæ, abdomen, and front legs simple.

Queensland : Brookfield, in October (H. Hacker). Types, in Queensland Museum.

Only three species were previously known with the third to fifth joints of antennæ distorted in male ; of these *H. distortus* has elytra entirely dark and tibiæ partly infuscated ; the figure of its antennæ[2] will give a good general idea of that

[2] Lea, Trans. Ent. Soc. Lond., 1909, pl. iii, fig. 32.

of this species. *H. inflatus* has antennæ entirely dark, third joint of male much smaller, and fifth differently formed, the elytra also have about half of the apex dark and legs (except an obscure portion of the front ones) entirely blackish. *H. microcerus* has the tenth and eleventh joints of antennæ also distorted.

Heteromastix terminalis n. sp.

♂. Flavous, apical fourth of elytra and abdomen infuscated.

Head gently convex and with two small impressions between eyes. Antennæ not very long, third joint slightly longer than fourth, the others to ninth subequal, tenth dilated to apex, one side of which is slightly notched, eleventh distorted and about as long as ninth and tenth combined. Prothorax almost twice as wide as long, sides evenly elevated and somewhat oblique. Elytra parallel-sided; with dense and fine rugulose punctures. Abdomen with a deep apical notch. Length, 3·5-4·0 mm.

Queensland: Cairns district (F. P. Dodd). Type, in South Australian Museum.

From *H. melanocephalus* and *luridicollis* differs in being narrower, less of elytra dark, head and antennæ entirely pale, and tenth-eleventh joints of antennæ different. The eleventh joint is incurved at the middle, with the apical portion narrower and slightly longer than the basal portion; although this is not very wide, its base is closely applied to the tenth, but connected with it only on one side.

Heteromastix apicicornis n. sp.

♂. Black, prothorax (including prosternum), scutellum, and front coxæ flavous, knees obscurely diluted with red.

Head with a shallow, interocular depression. Antennæ rather long and moderately stout, tenth and eleventh joints distorted. Prothorax more than twice as wide as long, sides evenly elevated and widest close to apex. Elytra parallel-sided; with crowded and small rugulose punctures. Abdominal notch distinct. Length, 6·5 mm.

New South Wales: Dorrigo (W. Heron). Type (unique), in South Australian Museum.

A rather large species of the genus, with the black legs and antennæ of *H. laticollis*, but the two apical joints of antennæ very different: the tenth joint is about as long as the ninth, but dilated to apex, curved inwards on the outer side, outwards on the inner side; the eleventh joint is about twice the length of the tenth, and varies in appearance with every point of view; its inner side is incurved between the middle and base, the base appears wide from some directions, very narrow from others; it has a spine directed inwards on the inner side and another directed backwards on the outer side, both being sometimes concealed; from some directions the basal half appears to be scooped out on one side.

Heteromastix undecimus n. sp.

♂. Black and flavous.

Head shallowly depressed between eyes. Antennæ not very long, third joint slightly longer than fourth, the others feebly decreasing in width to tenth, which is feebly notched on one side of apex, eleventh slightly longer than three preceding joints combined, subcylindrical to near apex, when it is suddenly narrowed and

becomes subconical. Prothorax about twice as long as wide, sides evenly elevated. Elytra parallel-sided to near apex; with crowded and small, rugulose punctures. Abdomen with a distinct notch. Tibiæ simple. Length, 4–5 mm.

♀. Differs in having the head slightly smaller, gently convex, antennæ shorter and thinner, tenth joint not notched at apex, eleventh slightly shorter than the three preceding combined, with its tip pointed but not suddenly narrowed and conical, and abdomen not notched.

Queensland: Brookfield, in October (H. Hacker). Types, in Queensland Museum.

The eleventh joint of antennæ of the male is different from that of all the species in which it is truly simple, but, as it is circular in cross-section throughout, the species can scarcely be regarded as belonging to the section in which it is distorted in the male. At first glance the antennæ appear to be twelve-jointed, with the apical joint thinner and about one-fourth the length of the preceding one. The black parts are the head, antennæ (except the two basal joints and part of the third), scutellum, apical two-fifths of elytra, metasternum, and abdomen; the apical joints of the tarsi are also infuscated. The front tibiæ are not dilated at the apex as on the male of *H. tibialis*, which is somewhat similarly coloured. It is larger than on *H. nigriventris*, with the head and more of the under surface black.

Heteromastix flaviventris n. sp.

♂. Black, prothorax and abdomen flavous.

Head with several feeble interocular impressions. Antennæ rather stout, extending to tip of first segment of abdomen, joints feebly serrated, third slightly stouter and shorter than fourth, the others to tenth subequal in length but becoming slightly thinner, eleventh subcylindrical, about one-third longer than tenth. Prothorax not quite twice as wide as long, sides evenly elevated. Elytra parallel-sided to near apex; with dense and small, rugulose punctures. Abdomen with a deep apical notch. Length, 5·5–6·0 mm.

New South Wales: Muswellbrook, in October (W. W. Froggatt). Type, in South Australian Museum.

Readily distinguished from the many species having the upper surface similarly coloured by the pale abdomen.

Heteromastix decipiens Lea.

Three specimens, recently taken near Sydney, evidently belong to this species. The female (hitherto unknown) differs from the male in having the two apical joints of antennæ simple and abdomen not notched; it is scarcely distinguishable from the female of *H. gagaticeps*, but the apical joint of antennæ of the male is longer and thinner than on the male of that species, and its base is different.

Heteromastix megalops Lea.

A male from New South Wales (Mount Wilson) appears to represent a variety of this species. It differs from the type in being larger (4·5 mm.) and of the legs only the knees are paler, but it has the same large eyes and long antennæ as on the type, and the prothoracic margins are as on *H. pusillus*.

Heteromastix nigripes Lea.

Four specimens from Victoria (Lower Tarwin) in the National Museum probably belong to this species, but are slightly larger than Tasmanian specimens, the antennæ are somewhat thicker, and the two basal joints are paler.

Heteromastix simplex Lea.

A specimen of this species from Mapleton, in the Queensland Museum, differs from the type in having the front and middle femora and tibiæ entirely pale.

Heteromastix mcdonaldi Lea.

Two specimens from the Upper Williams River (New South Wales) probably represent another variety of this species. They differ from the typical form in being slightly narrower, in having the ninth joint of antennæ smaller and more lop-sided, the eleventh joint decidedly longer and thinner, more of the legs black, and basal joints of antennæ pale.

Telephorus nobilitatus Er.

I previously[3] commented upon a variety of this species represented by two specimens from South Australia in the Macleay Museum. There are now numerous specimens of the same variety before me, from South Australia (Reevesby Island, Adelaide, Mindarie, and Karoonda); other specimens differ in having the apical patch of the prothorax divided in the middle by a pale line, and this gradually increases until there is only a small black spot on each side.

Luciola scutellaris n. sp.

♂. Black, prothorax (including lower surface), four front coxæ, and base of femora, and less of hind legs reddish flavous. With fine pubescence.

Head widely concave in middle and with rather dense punctures. Prothorax about twice as wide as long; with rather coarse, crowded punctures, and a distinct median line. Elytra with dense punctures; with two feeble ridges on each, and remnants of still more feeble ones. Abdomen with fourth segment and part of the fifth white. Length, 4·5–5·0 mm.

♀. Differs in having the head smaller, convex between eyes, and these smaller and only fourth segment of abdomen white.

North Australia: Groote Eylandt and Connection Island (N. B. Tindale). Type, in South Australian Museum; cotype, in Queensland Museum.

Consistently smaller than *L. humilis*, and scutellum blackish, but possibly it should be regarded as a variety only of that species. On the male the fourth segment of the abdomen is entirely white, on the fifth the white part does not extend to the sides, but is produced in the middle almost to the apex, much as on the males of *humilis*, all the many specimens of which before me have the scutellum no darker than the prothorax.

A specimen from Queensland (Stewart River, H. M. Hale and N. B. Tindale) probably belongs to the species, but has the legs entirely dark.

[3] Lea, Trans. Ent. Soc. Lond., 1909, p. 117.

Atyphella brevis Lea.

There are in the Queensland Museum four specimens on one card, of which two are males of this species; they differ from the type in being slightly darker; the two others are larvæ-like forms, and are possibly females (hitherto unknown) of the species.

Atyphella lychnus Oll.

Six males, from Mount Tambourine, taken in November, probably belong to this species; they differ from typical males, from Mount Wilson, in being slightly narrower, slightly brighter, and in the less pronounced infuscated blotch of the pronotum.

Laius semimaculatus n. sp.

♂. Reddish flavous, base of head, scutellum, metasternum, and parts of middle and of hind femora black or infuscated; apical joints of antennæ slightly infuscated, elytra metallic blue at base, purple at apex. Sparsely pubescent, and with straggling, greyish hairs.

Head with small punctures, with an obliquely flattened space in front. Antennæ with first joint large, curved, and dilated in front, second minute and almost concealed, third large, slightly longer than first, apex oblique, upper surface with two shallow impressions in front and a semi-double one behind, its lower surface evenly convex, the following ones small, but apical one almost as long as the two preceding combined. Prothorax slightly transverse, sides strongly rounded, with a wide depression at base; with minute punctures in middle, and some coarse ones on sides. Elytra slightly dilated from beyond the basal fourth, sides and suture thickened; with crowded punctures of moderate size, less crowded on some of the blue and purple parts than elsewhere. Front femora stout, strongly impressed in middle in front; second joint of front tarsi with a curved, black rim. Length, 3·5 mm.

North-west Australia: Forrest River (J. Clark from W. Crawshaw). Type (unique), in South Australian Museum.

Larger than *L. tetrastictus*, base of head dark, basal and apical marks not completely divided into spots at suture, and punctures different. &c. Without the prothoracic punctures of *L. purpureiceps*, which has head purplish, &c., The dilated third joint of antennæ is wider than on *L. trifoveicornis*, although the impressions are somewhat similar, but the two species are otherwise very different. The blue part of the elytra covers about the basal fourth, is sinuous posteriorly, and tipped with purplish; the purplish apex appears to be two large conjoined spots, extending to the apical third in middle, but only about the apical fifth at the suture. The dark part of the head has its front terminated in an incurved line connecting the eyes.

Laius v-flavus n. sp.

♂. Black, front of head with a V, parts of dilated joints of antennæ and most of elytra flavous, abdomen and tibiæ obscurely flavous in parts. With sparse and minute pubescence, and straggling, black hairs.

Head with sparse punctures, more numerous in middle of base than elsewhere, with feeble interocular impressions. First joint of antennæ dilated to apex, on one side of which there is an acute projection or spine, third large and widely transverse,

irregularly concave on upper surface and convex on lower, apical joint one half longer than subapical. Prothorax moderately transverse, sides strongly rounded, with two transverse basal elevations ; with crowded and small punctures on sides, inconspicuous in middle. Elytra feebly dilated to beyond the middle ; with crowded and small but fairly sharp punctures, becoming subgranulate on the postmedian spots. Front femora with a deep impression at apical third, second joint of front tarsi with a narrow, black rim. Length, 2 mm.

Queensland : Bathurst Head (H. M. Hale and N. B. Tindale). Type (unique), in South Australian Museum.

At first glance apparently belonging to *L. melanoderes,* but head with a pale V in front, head and prothorax with much sparser punctures, and basal joint of antennæ armed in front. The pubescence is also sparser, and the black hairs are longer and more numerous. The black parts of the elytra are the basal fourth and a large round postmedian spot on each, touching the side but not the suture.

Laius maculiventris n. sp.

♂. Flavous, some parts reddish flavous, head (except for a large pale apical spot), scutellum, metasternum, and a transverse spot on each side of most of the abdominal segments black, apex of hind femora and apical joints of antennæ infuscated ; elytra with four large purple spots. With long, straggling, black pubescence.

Head gently convex, with distinct but irregularly distributed punctures. Basal joint of antennæ stout, curved, dilated to apex and unarmed, third decidedly transverse, somewhat lopsided, irregularly concave on upper surface, convex on lower. Prothorax moderately transverse, sides strongly rounded, base widely depressed ; with dense punctures on sides, sparse elsewhere. Elytra with sides feebly dilated beyond the basal fourth ; with crowded and fairly coarse punctures, but absent from parts of the purple spots. Front femora with a deep median impression, second joint of front tarsi with a curved black rim. Length, 2·75 mm.

Western Australia : Geraldton (J. Clark). Type (unique), in South Australian Museum.

The elytral markings are much as on *L. cyrensis*, but the head is pale in front, and the true third joint of antennæ is very different. *L. carus* has basal joint of antennæ armed and with a black line, hind legs black, &c. *L. pallidus* has head entirely pale and third joint of antennæ of very different shape. *L. sinus* is a narrower species, with true third joint of very different shape. *L. tetrastictus* has true third joint longer than wide, instead of transverse, &c. The large elytral spots are basal and postmedian, the basal spots are rounded posteriorly, and touch the sides but not the suture, the postmedian spots are briefly elliptic, somewhat obliquely placed, and touch the sides for a short distance, but not the suture : the terminal joints of antennæ are deeply infuscated, but the infuscation decreases till near the dilated joints it almost vanishes.

Laius longus n. sp.

♂. Black, in parts with a purplish gloss, other parts flavous and almost white. Finely pubescent, and with not very long, scattered setæ.

Head with dense punctures and opaque, except for a shining, submedian space. Basal joint of antennæ large and dilated to apex, third wide, irregularly concave

on upper surface, rather strongly convex on lower. Prothorax slightly longer than wide, rather narrow at base and transversely impressed near it; with crowded punctures on a subopaque surface, except that in middle of apical half the surface is shining and almost impunctate. Elytra narrow, subparallel-sided; with crowded and rather small punctures, in places feebly granulate. Front femora rather feebly impressed in middle, second joint of front tarsi with a narrow, black rim. Length, 2 mm.

♀. Differs in having simple antennæ and front legs, smaller head, and less prominent eyes.

North Australia: Roper River (N. B. Tindale). Type (unique), in South Australian Museum.

A minute species with rather long prothorax and unusual elytral markings. The prothorax is of a dingy flavous, with much of the apex (including the entire margin) deeply infuscated or purplish black, the elytra have a wide, almost white, antemedian fascia, as long as the basal dark portion, but not touching the suture, and there is a large flavous apical spot on the suture, occupying about half the apical width, and more than one-fourth of the sutural length; the metasternum, parts of the abdomen and femora, are black, the rest of the legs and the dilated joints of antennæ are flavous, except that the tarsi are somewhat infuscated. On the male there is a small flavous spot in front of each eye, but it is not traceable on the female.

Laius fimbriceps n. sp.

♂. Flavous and reddish flavous, head black with a slight bluish gloss, the sides in front narrowly flavous, scutellum, metasternum, hind legs (except knees), and parts of middle femora black, elytra with two metallic blue spots at base, and a C-shaped, purple, subapical mark on each. With pale straggling hairs, almost absent from prothorax, but forming a conspicuous basal fringe on head.

Head gently convex between eyes, shallowly depressed in front: with sparse and minute punctures. Basal joint of antennæ convex, outlines almost equilaterally triangular, third large, irregularly foveate on upper surface, with a strong hollow projection on one side near base, lower surface convex. Prothorax transverse, sides strongly and evenly rounded, widely depressed near base; with sparse and minute punctures. Elytra almost parallel-sided to near apex; with crowded and rather sharply defined punctures, quite as dense on the subapical marks as on the adjacent parts, but absent from most of the basal spots. Front femora deeply impressed in front, front tarsi with a black rim. Length, 5·5 mm.

North-western Australia: Noonkanbah, in December (Dr. E. Mjöberg). Type (unique), in Stockholm Museum.

At first glance apparently belonging to *L. c-purpureus*, but head narrowly flavous on sides in front, the base with a long and conspicuous fringe of pale hairs, and first and third joints of antennæ very different. *L. major* and *tarsalis* are much larger and otherwise different. *L. verticalis* (Macleay, not Fairmaire) has the head concave, differently coloured, and with very different basal joints of antennæ. The spot on each side of base of elytra touches the side but not the suture, and is continued along the middle to the basal fourth, the C-shaped spot on each elytron is obliquely placed, correct on the left side, reversed on the right, the surface close to the spots is paler than elsewhere, but is probably subject to alteration with age. The

conspicuous fringe on the head is longer than the basal joint of antennæ. The impression on each front femur is so deep that it appears to divide it into two parts.

Laius curvicornis n. sp.

♂. Flavous and purple, in parts bluish. With minute pale pubescence, and with long, black hairs.

Head gently convex between eyes, depressed in front : with minute punctures. Antennæ with first joint large, strongly curved, apex obliquely produced, third large, irregularly concave and flavous on upper surface, convex and blackish on under surface. Prothorax transverse, sides strongly rounded, with a shallow depression near base ; with small, scattered punctures, becoming fairly numerous on sides. Elytra almost parallel-sided to near apex ; with crowded punctures of moderate size, quite as dense on the dark parts as elsewhere. Front femora transversely impressed in front, second joint of front tarsi with a black rim. Length, 5–6 mm.

♀. Differs in having the eyes less prominent, and antennæ and front legs simple.

North-western Australia : Kimberley district, in December (Dr. E. Mjöberg). Types, in Stockholm Museum.

In general appearance somewhat like the preceding species, but the distorted joints of antennæ are differently shaped, the postmedian marks on the elytra are less C-shaped and touch the sides, the basal spots are densely punctate throughout, more of the legs are dark, and the long hairs are dark and do not form a basal fringe on head. The elytral markings are somewhat as on *L. verticalis* (Macleay) and *c-purpureus*, but the head and legs are differently coloured, and the dilated joints of antennæ are differently shaped. *L. tarsalis* is considerably larger, with differently coloured head and legs, very different dilated joints of antennæ, and front legs. *L. major* is also much larger, with very different antennæ and front legs. The head is black with a bluish gloss, with a small pale spot on each side adjacent to an antenna ; the elytra have a large purple spot on each at the base, touching the side for a moderate distance, but the suture only at the extreme base, each also has a large postmedian somewhat C-shaped mark (correct on the left reversed on the right) touching the side, and with its beginning enlarged. The mesosternum, metasternum, and legs (except that parts of the front tarsi and the knees are obscurely diluted with red) are black, with a slight purplish gloss, the tip of the abdomen is also dark.

Laius megalops n. sp.

Black, flavous and purple. With sparse, whitish pubescence, and short, white hairs.

Head with a shallow, double depression in front ; with dense and irregular punctures about base, sparse elsewhere. Eyes large and prominent. Antennæ rather long and moderately serrated, first joint scarcely half the length of an eye, second minute and normally concealed, third flattened, slightly longer than first and eleventh, and distinctly longer than the others, eleventh about one-third longer than tenth. Prothorax moderately transverse, sides evenly rounded, transversely impressed near base ; with a few scattered punctures, becoming more numerous on sides. Elytra very feebly dilated to near apex, sides and suture slightly thickened ; surface densely wrinkled, obtusely granulate and punctate. Legs long and thin. Length 4·5 mm.

South Australia : N.E. corner (L. Reese). Type (unique), in South Australian Museum.

It is probable that the type is a male, but even if a female it is very distinct, from the many similarly coloured species, by its large eyes, and long and comparatively thin legs. *L. bellulus* is somewhat similarly coloured, but the punctures on its elytra are deep and sharply defined, although close together. On the present species they are so rugose that they are very ill-defined ; on that species also the eyes are decidedly smaller than the basal joint of antennæ. *L. orthodoxus*, *villosus*, *plagiaticollis* and similarly coloured species, also have much smaller eyes and more sharply defined punctures. *L. sculptus*, which has the third joint of antennæ simple, has much smaller eyes, and peculiar prothorax. The type has the abdomen shrivelled so much that I cannot be certain if the apex is truly notched, as it appears to be. The eyes are much larger than on any other species before me, and the space between them as a result appears concave, although the head itself is there slightly convex. The front femora are not transversely impressed, but several males of the genus have the front femora simple. The second joint of the front tarsi is large, and seems to have an apical fringe, but, as the joint is entirely dark, the apparent fringe may really be due to bristles, rather closer together than usual : certainly the joint itself does not appear to be that of a female. In the male of *L. effeminatus* the antennæ are very similar, but on that species the second joint of the front tarsi is large, reddish, and with a true masculine fringe. The head, antennæ (except that the basal joints are obscurely diluted with red), scutellum, under surface (except prosternum), and legs (except that the knees are obscurely reddish) are black, the elytra are a paler flavous than the prothorax, with the basal fourth and two large postmedian spots or a fascia purple, the basal portion has its posterior end sinuous, the postmedian markings touch the sides and suture, so should perhaps be regarded as forming a fascia rather than spots, the flavous apical portion is much smaller than the median portion.

Laius trisignatus Germ.

A male from the Coorong (South Australia) apparently represents a variety of this species ; it differs from typical specimens in having the prothorax flavous, with a large medioapical blackish spot ; the elytra are purplish, with lateral and apical markings, but the median spot is entirely absent, although the purple is less deep at its position.

Hypattalus pulchripennis n. sp.

♂. Flavous, head, except muzzle, black ; antennæ (basal joints partly pale), tarsi, middle and hind tibiæ, and part of hind femora, black or infuscated, elytra with a broad, purple band, extending from the basal fourth to the apical sixth. With minute, pale pubescence, and straggling, dark hairs.

Head with a shallow depression in front : punctures inconspicuous. Antennæ long and thin, first joint about twice the length of second, the others very feebly increasing in length, but eleventh distinctly longer than tenth. Prothorax strongly transverse, punctures sparse and minute. Elytra parallel-sided to near apex, with rather small but sharply defined punctures. Legs long and thin, front femora moderately curved, trochanters very conspicuous. Length, 2·75–3·25 mm.

♀. Differs in having less of the muzzle pale, more of the antennæ and legs pale, front trochanters inconspicuous, and hind tibiæ spurred.

New South Wales: Upper Williams River, in October (A. M. Lea). Queensland: National Park, in November (H. Haeker). Male, in South Australian Museum; female, in Queensland Museum.

In the 1909 table of the genus[4] this species could be referred to A, as the front femora of the male are distinctly curved (although less so than on several species of the section), with large, projecting trochanters. Of the species placed there *H. mirabilis* and *pulcherrimus* have black antennæ (which are also shorter), legs and scutellum, and the elytra have stronger punctures, and less of their tips pale; the latter species also has much of the pronotum dark. Of the species with spurred hind tibiæ in the female, this is distinct from *H. dentipes* and *calcaratus* by its larger size and bicoloured elytra; the spur is blunt-tipped, and only about half the length of the first tarsal joint, but as it is alike on both tibiæ it is evidently not broken. *H. tricolor*, with bicolorous elytra, has those organs dark blue, except at their tips, and is a much smaller species. From some directions the hind tarsi appear to be but four-jointed, this being due to the second apparently continuing the lines of the first, but from other directions the junction between them is distinct. The purple band on the elytra of the male touches the margins, but on the female these are narrowly excepted, and the pale portion narrowly encroaches on it along the suture.

Hypattalus armipes n. sp.

♀. Black, flavous, and purple. With sparse, whitish pubescence, and short, subcrect, dark setæ.

Head gently convex, with minute punctures. Antennæ long, thin, and slightly serrated. Prothorax strongly transverse, with small punctures. Elytra feebly dilated to beyond the middle, the sides then suddenly narrowed and rounded to apex; with dense, sharply defined punctures of moderate size. Legs long and thin, hind tibiæ moderately curved, slightly dilated to apex, and with a long apical spur. Length, 3 mm.

Queensland: National Park, in November (H. Haeker). Type (unique), in Queensland Museum.

Another species with spurred hind tibiæ in female, from the preceding one it differs in having the spur much longer, thinner, and curved (about one-fourth the length of the tibia itself), the elytra with basal and postmedian markings, and their sides very different (approaching those of the female of *H. mucronatus*). The black parts are the head, metasternum, and most of the antennæ and legs; the purple parts are the basal fourth of elytra, and two large postmedian spots, touching the sides but not the suture.

Hypattalus pectinicornis n. sp.

♂. Flavous, head and most of antennæ black, elytra with basal fourth and a somewhat larger postmedian space purple; parts of legs infuscated. With sparse, whitish pubescence, and straggling, dark hairs.

Head strongly transverse; with two small foveæ in front, and with minute punctures. Eyes prominent. Antennæ rather long, first joint about twice as long as second, the latter rounded, third and fourth triangular, fifth-tenth pectinated, the teeth equal or subequal to their supporting joints, eleventh distinctly longer

[4] Lea, Trans. Ent. Soc. Lond., p. 169.

than tenth. Prothorax strongly transverse, angles rounded off, transversely depressed near base; with sparse and minute punctures. Elytra with sides feebly dilated to beyond the middle, and then evenly rounded to apex; with dense and rather small, but sharply defined punctures. Legs moderately long and thin. Length, 3 mm.

♀. Differs in having less prominent eyes, antennæ shorter and serrated only, and somewhat shorter legs.

Queensland: National Park, in October (H. Hacker). Types, in Queensland Museum.

The male is very distinct from all other known species of the genus by its pectinated antennæ. In the 1909 table of the genus, it could be associated with *H. alphabeticus*, which is a much smaller and otherwise different species. At first glance the female resembles the female of the preceding species, but its hind tibiæ are not spurred, and the sides of the elytra have even outlines. On the female the metasternum is deep black, on the male only its sides are infuscated; on the female also the legs are almost black.

Carphurus nigrivarius n. sp.

♂. Flavous or reddish flavous, with black markings. With sparse whitish pubescence and straggling black hairs.

Head with a large depression on each side in front, with a small oblique elevation near each eye, and a shallow depression in middle, with an impressed median line; dense punctures about base, irregular elsewhere. Antennæ moderately long, third-tenth joints serrated, eleventh slightly longer than tenth, obtusely notched at tip. Prothorax slightly longer than wide, with a wide shallow depression near base, and a few scattered punctures. Elytra with each side strongly incurved between middle and apical third, just before its end with a blunt-tipped process directed obliquely forwards, but one side of the process drawn slightly backwards; with numerous punctures varying from rather small but well-defined, to very small and shallow. Basal joint of front tarsi not very large, with a black inner rim. Length, 6·0–6·5 mm.

Queensland: Stanthorpe, in October (H. Jarvis). New South Wales: Tamworth (A. M. Lea). Type, in South Australian Museum.

Allied to *C. cristatifrons*, but head not crested, and spine on each elytron blunt-tipped. The black parts are a large mediobasal spot on the head, scutellum, a curved mark on each elytron, beginning on the base below the shoulder, and curved round so as to occupy most of the median third, mesosternum, metasternum, five basal segments of abdomen, except tips and sides, parts of femora and tarsi, and six or seven joints of antennæ. On each of two specimens, from Stanthorpe, the apical segment of abdomen is entirely pale, on the Tamworth one only two apical segments are. On the type the curved mark on each elytron does not quite extend to the suture, on the second specimen it touches the suture for its median third; on the Tamworth one it occupies more than the median third and is, in addition, narrowly continued along the suture to the base.

A male from Brisbane, in September (H. Hacker), in the Queensland Museum, appears to belong to this species, but differs from the type in having the process on each elytron thinner and curved backwards so as to appear like a hook (the

process is not exactly alike on the three other specimens), the curved mark on each elytron is narrower, does not touch the suture, and terminates before the base, two apical segments of abdomen are pale, the others, as also the femora, have a smaller proportion black.

Carphurus incurvipennis n. sp.

♂. Flavous; elytra (except part of base) of a rather dingy purple. With sparse, whitish pubescence, and straggling, dark hairs.

Head rather long, with four postmedian and two subapical impressions, base transversely strigose; elsewhere with scattered punctures. Eyes rather large. Antennæ moderately long, feebly serrated, eleventh joint about half the length of first, and distinctly longer than tenth. Prothorax about as long as its greatest width, widely and shallowly depressed near base; with a few scattered punctures. Elytra with dense, sharply defined punctures of moderate size, becoming smaller about base and apex, each side strongly incurved at basal third and then straight to apex. Basal joint of front tarsi with a black inner comb. Length, 6 mm.

Queensland: Brisbane (A. M. Lea). Type, in South Australian Museum.

This species appears to connect the *armipennis* group with the more normal forms, as each side of the elytra is incurved at the basal third, but no part is produced backwards, as on *C. armipennis*, *fasciculatus*, *uncinatus*, *balteatus*, and *purpureipennis*; on the last-named species the part is less produced than on the others, but it is pale at the tip, and parts of the legs and of the antennæ are deep black, whereas on this species the legs (except for the tarsal combs) and antennæ are entirely pale. The curvature of the side of each elytron is not visible from directly above, except that its beginning appears as a small subtriangular tooth. On the type the metasternum, except its episterna, is deeply infuscated, on a second specimen it is scarcely darker than the rest of the under surface. On each there is a small black fascicle between the eyes, so strongly curved backwards that its point actually touches the head; it is probable, however, that it does not always do so.

Carphurus wilsoni n. sp.

♂. Flavous red, coppery green, and black. With sparse, whitish pubescence, becoming fairly dense on elytra, and with straggling, black hairs.

Head moderately large, with a small interocular fovea and four irregular ones in front, a shallow curved impression towards base, base itself transversely strigose and punctate. Antennæ moderately long, rather feebly serrated, eleventh joint distinctly longer than tenth. Prothorax about as long as its greatest width, with a wide irregular impression on apical half, the median part large and rather deep, an irregular impression on each side of base; with scattered punctures, becoming fairly numerous on sides. Elytra slightly dilated posteriorly: with crowded, somewhat rugose punctures of moderate size, becoming smaller but more sharply defined about base and apex. Basal joint of front tarsi moderately long, with a black inner comb. Length, 5·5 mm.

Victoria: Linga, in October. Type (unique), in Mr. F. E. Wilson's collection.

A very distinct species, allied to *C. rhytideres*, from the male of which it differs

in having the subapical impression of prothorax shallower, less of it black, with the oblique subbasal impressions reduced to a fovea on each side, and not marked by black fascicles; the antennæ are also somewhat shorter and thinner, much as on the female of that species. The black parts are the base of the head, seven apical joints of antennæ and part of the preceding one, a small medioapical clothed spot on pronotum, scutellum, mesosternum, metasternum, abdomen (except the tip and the sides of the other segments), femora, and parts of tarsi; the elytra are entirely dark coppery green.

Carphurus sagittifer n. sp.

♂. Flavous; elytra, except basal fifth, apical segment of abdomen, most of middle and of hind legs, and five or six apical joints of antennæ, black or blackish. With sparse pubescence, and numerous not very long, dark hairs.

Head rather large, with two fairly large foveæ in front (open posteriorly, closed in front), a shallow, transverse, postmedian impression; with dense punctures towards base, sparse elsewhere. Eyes rather large and prominent. Antennæ rather long, fourth-tenth joints strongly serrated. Prothorax slightly longer than wide, a shallow transverse impression near apex and another near base; with a few scattered punctures. Elytra comparatively long; with crowded small, rugose punctures. Basal joint of front tarsi about as long as the rest combined, with a black inner comb. Length, 6–8 mm.

♀. Differs in having the head smaller, with shallower impressions, eyes smaller, antennæ slightly shorter, but almost as strongly serrated, and basal joint of front tarsi much shorter and simple.

Queensland: Cairns district (F. P. Dodd). Types, in South Australian Museum.

Belongs to a group of which it is not always easy to decide by a single specimen if it is a male *Carphurus*, or a female *Balanophorus*, but as there are two females, with simple front tarsi, it is certainly a *Carphurus*. In appearance it is fairly close to *C. elegans* and *longus*, but the male of the former has an unusually long basal joint of front tarsi, and the female of the latter has long, thin, and scarcely serrated antennæ. Rather close to *C. compsus*, but each of the sixth-tenth joints of antennæ has its oblique anterior edge at least half as long again as the outer edge (where the joints are attached to each other), but on *compsus* the oblique anterior edge is not as long as the outer edge, so that the serrations on the latter (although decided) are much less pronounced than on the present species; on the female of *compsus* they are not even strongly serrated. The elytra are purplish black rather than a true black, but on one female the dark part has a slight coppery gloss; on each of the females, and on a second male, the middle legs are almost entirely pale. On the type male only the metasternum is partly infuscated. The cephalic foveæ of the male are so placed that their front is bounded by a broad, elevated arrowhead.

Carphurus armicollis n. sp.

♂. Of a dingy flavous brown; mesosternum, metasternum, abdomen, most of legs, palpi, and apical half of antennæ, black or infuscated. With sparse, white pubescence, and straggling, black hairs.

Head with an obtuse median elevation, with shallow impressions before and behind it; with irregularly distributed punctures, dense in parts. Antennæ moderately long, slightly serrated. Prothorax distinctly longer than wide, with two acute points marking a distinct medioapical noteh; with numerous irregularly

distributed punctures. Elytra moderately long; with dense, sharply defined punctures, becoming sparser and smaller on tips. Basal joint of front tarsi moderately long, with a black inner comb. Length, 3·5–4·0 mm.

Queensland: Cairns district, trapped by sticky seeds of *Pisonia brunoniana* (F. P. Dodd). Type, in South Australian Museum.

Evidently allied to *C. marginiventris* and *pallidipennis*, but distinguished from both by the nonmaculate prothorax: the male of the latter has the prothorax notched in front, but the notch is narrower than on the present species, on which it is about twice as wide as long, with the sides produced forwards as rather short but sharp points. There is a small granule on each elytron in the middle of the basal third, as on the former species, but as it is no darker than the adjacent parts it would probably not be seen, unless looked for. On the type there appears to be a distinct median carina on the pronotum, on a second specimen it is less defined but traceable. Two males were obtained; *C. pisoniæ* (of which many more males were recently obtained, that were trapped by the same seeds) has armed elytra.

Carphurus armiceps n. sp.

♂. Flavous; apex of elytra, part of metasternum, apical segment of abdomen, and a median blotch on most of the others, and seven apical joints of antennæ, blackish or deeply infuscated. With sparse pubescence, and rather numerous, dark hairs.

Head fairly large, with a large interocular excavation, and a smaller but still large one on each side towards the base, between the latter a strong curved process, which in front hangs over the interocular excavation and is tipped with black hairs. Eyes rather large and prominent. Antennæ rather long, fifth and sixth joints produced inwards and truncated, seventh-tenth serrated, eleventh distinctly longer than tenth. Prothorax longer than wide, shallowly impressed towards base, with two small foveæ in the middle of apex, the adjacent parts slightly infuscated, with small, scattered punctures. Elytra moderately long, slightly dilated posteriorly; with numerous small punctures. Basal joint of front tarsi not very long, with a black inner comb. Length, 5·5 mm.

Queensland: National Park, in November (H. Hacker). Type (unique), in Queensland Museum.

Readily distinguished from all previously described species by the antennæ; the sculpture of the head and prothorax are also distinctive. From the sides the strong elevation on the head has a claw-like appearance, from directly above it is seen to be concave, with the sides as narrow ridges conjoined in front; there is a small fascicle on the head below its tip. The elytra are semi-transparent, and although only about the apical fourth is really infuscated, more than half of the apex appears dark, owing to the black wings being partly visible; the elytral punctures are small but fairly sharp.

Carphurus modicus n. sp.

♂. Flavous; elytra, except extreme base, purplish black, femora, most of tarsi, and eight apical joints of antennæ, black or deeply infuscated. With fine, white pubescence, and straggling, dark hairs.

Head with a curved impression in front, with three elevations between eyes, the median one small, the others long and semi-double; with dense punctures,

about base transversely strigose. Antennæ not very long and moderately serrated. Prothorax slightly longer than the greatest width, widely depressed near base; sides with sharply defined punctures, elsewhere sparse and small. Elytra with crowded and rather small, but sharply defined punctures. Basal joint of front tarsi with an inner black comb. Length, 5 mm.

Queensland: Kuranda, in February (F. P. Dodd). Type, in South Australian Museum.

The eyes are much smaller than on *C. vigilans*, which is somewhat similarly coloured, and the interocular elevations are different. On the type each elytron is suddenly dilated from the basal third, but this is almost certainly due to post-mortem shrinkage.

A specimen from Kuranda, taken by Mr. Dodd in December, agrees so perfectly in all details of colour and sculpture, except of parts of the head, with those of the type, that it evidently belongs to the species. On it the curved frontal impression of the type is interrupted in the middle by a bottle-shaped extension of the median elevation, much as on the head of *Helcogaster bacchanalis*: between this and each eye are two small elevations completely divided, instead of semi-double. Its elytra are parallel-sided throughout, and clasp the abdomen in the usual way.

Carphurus pallidipennis Macl., var. **excrementarius** n. var.

A male from the Upper Williams River (New South Wales) evidently belongs to this species, as the median apex of the prothorax has the conjoined foveæ of the species, as previously noted,[5] but each elytron has a small and conspicuous blackish granule at the middle of the basal third (the two look just like fly-speeks); on the previously noted specimens they are paler and just traceable.

Carphurus marginiventris Fairm.

The starting point of the longitudinal infuscation on each elytron of this species is marked by a small granule that could be easily overlooked on some specimens, but is very distinct on others.

Helcogaster bifoveiceps n. sp.

♂. Deep shining black, elytra whitish flavous, a rounded space about scutellum (occupying about the median third of base) and apical third, black or blackish; parts of front legs and basal half of antennæ obscurely reddish. With scattered, black hairs.

Head flattened, with two small round foveæ in front. Antennæ rather short and feebly serrated. Prothorax moderately transverse, sides rounded, almost impunctate. Elytra slightly longer than head and prothorax combined, sides feebly dilated to near apex; almost impunctate. Basal joint of front tarsi moderately long, with a black inner comb. Length, 3 mm.

♀. Differs in having the frontal foveæ smaller, and shallower, the antennæ slightly shorter, and the elytra and abdomen wider.

Victoria: Mooroopna, in January (F. E. Wilson). Types, in South Australian Museum; cotypes, in Mr. Wilson's collection.

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[5] Lea, Trans. Ent. Soc. Lond., 1909, p. 193.

A black species with partly flavous, almost white, elytra ; of several similarly coloured species, *H. opaciceps*, *cribriceps*, and *medioflavus* have differently sculptured head and longer and distinctly serrated antennæ ; *opaciceps* also has more of the base of the elytra dark, and *medioflavus* has less. *H. flavipennis* has paler antennæ and elytra, and differs slightly in the sculpture of the head. The head of the male is distinctly bifoveate, but is not strongly sculptured otherwise. The female has the frontal foveæ somewhat smaller than on the male, but has a fairly distinct median line, which is scarcely traceable on the male. Under the microscope the comb of the front tarsi is seen to be composed of about thirty teeth.

Helcogaster medioniger n. sp.

♂. Deep shining black, head dull flavous, with a complete median black vitta, basal third of antennæ and parts of legs pale. Glabrous, except for minute pubescence almost confined to legs.

Head wide and somewhat flattened near eyes, with an interocular impression, margining which are three small elevations, two in front and one behind. Antennæ rather long and feebly serrated. Prothorax moderately transverse, with a rather deep transverse impression near base ; with scattered punctures. Elytra with minute, rugose punctures. Basal joint of front tarsi with a conspicuous black inner comb. Length, 1·8–2·0 mm.

New South Wales : Upper Williams River, in October (A. M. Lea). Type, in South Australian Museum.

In many respects close to *H. cælocephalus*, but on the male of that species the head, when viewed from behind, is seen to have four triangular elevations—two black median ones and a pale one near each eye ; the head of the present species is flat near the eyes, and although there are three dark median elevations they are not distinct when viewed from behind. The colours, except that the legs are more variegated, are much as on *H. triangulifer*, but the head is very differently sculptured. The head is pale, with a dark median vitta appearing parallel from some directions ; parts of all the tarsi, the middle and hind knees and tips of tibiæ, the front tibiæ and most of front femora, are more or less flavous.

Helcogaster holomelas n. sp.

♂. Deep shining black, parts of the mouth obscurely diluted with red. Head minutely pubescent, elsewhere almost glabrous.

Head convex, with a reversed V-shaped impression, caused by two conjoined foveæ in front, and with a faint interocular impression. Antennæ moderately long and feebly serrated. Prothorax moderately transverse, with a rather deep transverse subbasal impression ; with a few scattered punctures. Elytra with fairly numerous but minute wrinkled punctures. Length, 2·5–3·0 mm.

♀. Differs in having the head smaller, with shallower impressions, the antennæ slightly shorter, and the front tarsi simple.

Queensland : Somerset and Mabuiag Island (C. T. McNamara). Types, in South Australian Museum.

An entirely black species, except for the obscure muzzle, but larger than *H. gagatinus*, and frontal impressions shallowly connected so as not to be two

isolated foveæ. The variety *tasmanicnsis*, of that speeies, is quite as large, but its frontal impressions are different. *H. effeminatus* is similarly coloured, but differs in the front of the head and has longer and distinctly serrated antennæ. *H. puncticeps* has head conspicuously punctate and different in front. As the legs are entirely black the comb of the male is not distinct under a magnifying glass, but under the microscope the basal joint of the front tarsi is seen to be eurved, and to have a comb of numerous teeth.

A male from Murray Island (A. M. Lea) appears to belong to the species, but is slightly larger (3·5 mm) and has more of the muzzle obscurely pale.

Helcogaster trifoveatus n. sp.

♂. Deep shining black, head partly flavous, three basal joints of antennæ and parts of front legs obscurely pale. Almost glabrous.

Head wide, with three conjoined foveæ between eyes, the median one small, each of the others slightly larger than an eye. Antennæ rather long and moderately serrated. Prothorax moderately transverse, transversely impressed near base; with small, scattered punctures. Elytra with scarcely visible punctures. Length, 2·0 2·2 mm.

Queensland: Brisbane, in August and September (H. Hacker). Type, in Queensland Museum; cotype, in South Australian Museum.

With the general appearance of *H. triangulifer*, but the head has a trilobed excavation of whieh each side consists of a well-defined fovea, and the middle of a smaller one; as a result the middle of its posterior margin is incurved, whereas on that species the middle of the excavation is triangularly produeed forwards, besides being otherwise different. The exeavation, except at the sides, and the base of the head are blaek. As the front tarsi are black the comb of the male is scarcely visible under a magnifying glass.

Mounted on the same card with the type male is a female, that differs from it in being longer, the head less dilated, nonfoveate, only part of the muzzle pale, the antennæ shorter, less serrated, and the front tarsi without a eomb. It is probably correctly mated, but I can scareely distinguish it from some females of *H. foveiceps*. In fact, at present, as on former occasions, I have had to pass over many females of the genus as being impossible of differentiation, although the males have very distinctive features in the head and prothorax.

Helcogaster frater n. sp.

♂. Black; prothorax flavous, under surface of three basal joints of antennæ, front tibiæ, and parts of tarsi, and middle and hind knees obscurely pale. Head sparsely clothed, elsewhere glabrous or almost so.

Head with a large, eurved, shining impression near each eye, the two connected by a smaller semi-double impression, between middle and apex a somewhat convex space, with a feeble median line; in places punetate but not strigose. Antennæ moderately long and very feebly serrated. Prothorax almost as long as the greatest width, with a wide subbasal impression; almost impunctate. Elytra moderately long, scarcely visibly punctate. Basal joint of front tarsi modcrately long, with an inner blaek comb. Length, 3 mm.

New South Wales: Tamworth (A. M. Lea). Type (unique), in South Australian Museum.

In general appearance strikingly close to *H. strigiceps*, but the head is not strigose, and the impressions are different; just inwards of each eye, and slightly longer than it, there is a deep, curved, polished impression, the interspace being opaque, densely punctate and with a feeble semi-double impression. Seen from behind the head appears to have two minute interocular elevations, partly obscured by black setæ: from some directions the base of the excavation appears almost evenly quadrisinuate. The antennæ also are decidedly longer, most of the joints being longer than wide; on that species they are mostly transverse. On *H. atriceps* the eyes are smaller, the head is densely punctate almost throughout, and the impressions are different. The mediobasal sinus decidedly narrower than the lateral ones distinguishes from the description of *H. nigriceps*. In some lights the elytra appear somewhat purplish.

Helcogaster apiciniger n. sp.

♂. Reddish flavous: apical three-fourths of elytra (less on the sides), part of metasternum, two apical segments of abdomen, tip of the preceding one, and seven apical joints of antennæ black, tarsi and parts of middle and of hind tibiæ infuscated. In parts with very fine pubescence, and with a few short, scattered hairs.

Head with a large trilobed median excavation, a conspicuous tubercle arising from the middle part, and sloping down to the front. Antennæ long and feebly serrated. Prothorax slightly longer than wide, with a wide depression near base: almost impunctate. Elytra rather long, with minute, scattered, rugose punctures. Basal joint of front tarsi rather long, with an inner black rim. Length, 4·5 mm.

♀. Differs in having the head smaller and almost entirely black, non-excavated, with an obtuse median ridge from middle to apex, antennæ thinner and front tarsi simple.

New South Wales: Upper Williams River (F. E. Wilson and A. M. Lea). Types, in South Australian Museum.

Of the species with bicoloured elytra and abdomen tipped with black in the male, it differs from *H. bacchanalis* and *trisinuatus* in the strong interocular elevation. The base of the cephalic excavation trisinuate distinguishes from *H. tuberculiceps*, *calodemus*, and *seticeps*. There is a faint bluish gloss on the dark part of the elytra. From behind the trisinuate excavation of the head disappears, but there is a conspicuous triangular median elevation.

Helcogaster abdominalis n. sp.

♂. Flavous; apical third of elytra, metasternum, a spot on each segment of abdomen, the apical one, and six or seven apical joints of antennæ black or blackish, apical joints of tarsi slightly infuscated. With sparse and comparatively short, blackish hairs.

Head with a deep interocular impression, its base trisinuate, with three small elevations in front; base punctate and transversely strigose. Antennæ rather long and feebly serrated. Prothorax slightly longer than wide, rather deeply transversely impressed near base; with a few small scattered punctures. Elytra feebly dilated posteriorly, scarcely visibly punctate. Basal joint of front tarsi moderately long, with a small black inner comb. Length, 4–5 mm.

♀. Differs in having a wide shallow impression on the front of the head, which is non-tubereulate, antennæ thinner and even less serrated, abdomen wider and front tarsi simple.

New South Wales: Upper Williams River (F. E. Wilson and A. M. Lea).

The colours, except for the spotted abdomen, are as on *H. trisinuatus*, but the head is differently sculptured, the trisinuate base of the excavation distinguishes from *H. rhyticephalus*, and less of the abdomen is spotted, &c. The median sinus of the head is wider than the lateral one: seen from behind there appear to be three small elevations, a blunt median one (placed in front of the excavation), and a small acute one on each side of it (each placed near an antenna); from the sides there appear to be three small tubercles on each side: the median one, one near each antenna, and the front end of the median sinus. There is a small black spot at the base of the head, but it is normally concealed by the overlapping prothorax. A second male has rather more of the elytra dark than the type. The only female in the Museum, that appears to belong to the species, has the scutellum black, the apical half of elytra (except the extreme margins) black, with the black triangularly advanced on the suture, and the tip of abdomen, as well as a spot on each segment, black.

Helcogaster affinis n. sp.

♂. Flavous: base of head, scutellum, apical half of elytra, metasternum, abdomen, and seven apical joints of antennæ black or blackish. Sparsely pubescent.

Head with an interocular impression trisinuate posteriorly. Antennæ moderately long and feebly serrated. Prothorax slightly longer than the greatest width, widely transversely depressed near base; with a few scattered punctures. Elytra with minute, wrinkled punctures. Basal joint of front tarsi with a black inner comb. Length, 3 mm.

♀. Differs in having the head more convex and narrower across eyes, with two small frontal depressions and a shallow median line, more of its base blackish, antennæ thinner and not serrated, parts of the legs infuscated and front tarsi simple.

New South Wales: Upper Williams River (A. M. Lea). Types, in South Australian Museum.

The head of the male is not longitudinally sulcate to base, as on the male of *H. sulciceps*, which it greatly resembles, and the antennæ are longer. The excavation of the head is somewhat obscured by pubescence, it is trisinuate posteriorly, but the median sinus is rather small; there is a small median elevation, but it is not visible when the head is viewed from behind; the only sharply defined punctures on the head are on the black basal spot.

Helcogaster tuberculiceps n. sp.

♂. Flavous; apical two-thirds of elytra, metasternum, two apical segments of abdomen, and seven apical joints of antennæ black, palpi and parts of tarsi infuscated. Sparsely pubescent and with a few dark hairs, more numerous on head and tip of abdomen than elsewhere.

Head with a wide interocular depression, evenly curved posteriorly; with a strong median tubercle sloping down to the apex; base rather densely punctate. Antennæ long and feebly serrated. Prothorax about as long as its greatest width, widely depressed near base; with a few scattered punctures, the sides feebly

wrinkled. Elytra feebly dilated posteriorly; with fairly numerous but not dense, small, rugose punctures. Basal joint of front tarsi with a small black inner comb. Length, 3 mm.

New South Wales: Upper Williams River (A. M. Lea). Type, in South Australian Museum.

In many respects near *H. tuberculifrons*, but on the male of that species the head is partly dark, and the tubercle when viewed from behind appears semi-double[6]; on the present species when so viewed it appears to be higher and flat-topped, although hardly T-shaped. The colours are almost exactly as on *H. apiciniger*, but on the male of that species the excavation is trisinuate posteriorly, and the elevation is larger and obtusely pointed, as viewed from behind.

A female on the same card as the type possibly belongs to the species; it differs in having the head narrower and more convex, obliquely flattened in front, not excavated or tuberculate, black except for parts of muzzle, with more conspicuous punctures, antennæ thinner and not serrated, abdomen entirely black, and front tarsi simple.

Helcogaster calodemus n. sp.

♂. Flavous, in parts reddish flavous; head, except the elevated parts in front, apical three-fifths of elytra, two apical segments of abdomen, and seven apical joints of antennæ black. With fairly numerous dark hairs and in parts sparsely pubescent.

Head with an obtuse median elevation, crowned with two short longitudinal ridges; with fairly numerous punctures, the base, more noticeably on sides than middle, transversely strigose. Eyes large and prominent. Antennæ long and feebly serrated, only the second joint transverse. Prothorax slightly longer than wide, widely depressed near base; with small, scattered punctures. Elytra comparatively long; with minute rugose punctures. Basal joint of front tarsi rather long, with a black inner comb. Length, 6 mm.

Queensland: Brisbane (H. Hacker). Type (unique), in Queensland Museum.

The colours are much as on *H. tuberculifrons*, except that more of the head is dark, but it differs from that species in being much larger, the eyes larger, with the frontal elevation smaller in proportion, black at the base and with two small disconnected, reddish elevations. Seen from behind the head appears much as figured for that species[6] except that the elevations are more conspicuous. There is also a narrow ridge from each eye to the base of an antenna.

Helcogaster seticeps n. sp.

♂. Flavous or reddish flavous: apical three-fourths of elytra, apical segment of abdomen, and most of the preceding one black, four or five apical joints of antennæ and parts of tarsi infuscated. With straggling black hairs, and in parts sparsely pubescent.

Head with an obtuse median elevation connected with the apex by an obtuse ridge, a large shallow fovea near each eye. Antennæ rather long and feebly serrated.

[6] Lea, Trans. Ent. Soc. Lond., 1909, pl. ii, fig. 10.

Prothorax longer than its greatest width, widely depressed near base ; with minute, scattered punctures. Elytra moderately long, slightly dilated posteriorly ; with minute rugose punctures. Basal joint of front tarsi with a black inner comb. Length, 4·0–4·5 mm.

♀. Differs in having the head almost entirely black, the antennæ thinner and even less serrated, less of the elytra black, and the front tarsi simple.

Queensland : Mount Glorious, in September (H. Hacker). Types, in Queensland Museum.

The colours are much as those of *H. tuberculifrons*, and of the preceding species, except that the base of the head is not dark : from the former it also differs in being considerably larger ; the latter has larger eyes and the head without foveæ. *H. tuberculiceps* is similarly coloured, but the tubercle and excavation on the head are different. The females are scarcely to be distinguished from the females of several other species. The median elevation on the head of the male is obscured by rather numerous black setæ, which almost conceal a narrow transverse impression, behind it, from some directions, they seem to be compacted into two short transverse rows, this being due to an almost concealed transverse impression between them. Close to each eye there is a rather large fovea, appearing simple from some directions, semi-double from others.

Helcogaster gagatinus Lea.

Seven specimens, from the Cairns district, belong to this species, and, apart from slight differences of shades of colour of the front legs, agree so closely with the typical form that it does not appear desirable to name them as varietal.

Helcogaster foveiceps Lea.

Some males from Ringwood (Victoria), in the National Museum, differ from typical specimens, with which they were taken, in having the prothorax with a narrow blackish basal fascia up to almost entirely black ; they have the median joints of antennæ more deeply infuscated than usual ; one female has one of the apical joints pale. Numerous males from Brisbane, Sunnybank, and Mount Coot-tha, in the Queensland Museum, have the median joints of antennæ more lightly infuscated than usual ; on two of them, in fact, the antennæ are uniformly pale. Several females, taken with them, have some of the apical joints of antennæ pale.

Helcogaster medioapicalis Lea.

A male from Sydney differs from the type in having the prothorax entirely pale, with the medioapical notch smaller.

Neocarphurus seminiger n. sp.

♂. Flavous and deep, shining black. Very sparsely clothed.

Head with a large interocular tubercle, on each side of which is a distinct fovea, base with rather dense punctures. Antennæ long and thin, scarcely serrated. Prothorax distinctly longer than wide, convex in front and much wider there than near base, where there is a deep transverse impression, sides finely longitudinally strigose, elsewhere with minute punctures. Elytra about as long as head and prothorax combined, with a large subtriangular impression on each side at apical

third, almost impunctate. Legs long, basal joint of front tarsi with a small, black, inner comb. Length, 3 mm.

Queensland : Somerset (C. T. McNamara). Type (unique), in South Australian Museum.

Allied to *N. semiflavus*, but antennæ thinner (only the second joint transverse), elytra with the black part obtusely advanced suturally, nowhere opaque, and impressed on each side near apex. The flavous parts are the head, prothorax, basal fourth of elytra (shoulders infuscated), prosternum, mesosternum, antennæ (three apical joints infuscated), and legs (tibiæ slightly infuscated). The cephalic tubercle, from behind, appears simple, from the sides it is seen to be slightly impressed in the middle.

Neocarphurus insignis n. sp.

♂. Black and flavous. With sparse white pubescence and straggling hairs on abdomen, legs, and basal joint of antennæ.

Head large, surface very uneven ; clypeus long, with a median elevation. Eyes large, lateral, and pointed in front. Antennæ thin, none of the joints transverse. Prothorax longer than wide, sides narrowed from apex to base, which is strongly depressed, apex obtusely incurved at middle ; with a median line distinct on basal half, and traceable to apex ; with small, rugose punctures. Elytra parallel-sided, slightly longer than head and prothorax combined ; with dense, sharply defined punctures of moderate size. Legs long and very thin, basal joint of front tarsi with a black inner comb. Length, 4 mm.

New Guinea : Finsch Haven (Rev. L. Wagner). Type, in South Australian Museum.

The dense and sharply defined punctures on the elytra are at variance with all other species of the genus, but the wide apex of prothorax, its strongly narrowed and greatly depressed base, and eyes (when wet) of a brilliant emerald green, are as on others of the genus ; which is now first recorded from New Guinea. On the type there is a compound interocular elevation, with a small spine directed forwards ; between it and each eye there is a round fovea, the two obtusely connected in front. behind it there is another fovea, which is continued under the apex of prothorax ; behind each eye there is also a fovea, which is distinct only from the side. On a second specimen the head has the mediobasal fovea quite as large as on the type, the postocular foveæ are similar, but the space between the eyes and in front is irregularly undulating, rather than foveate and tuberculate. The differences are evidently due to post-mortem shrinkage. The flavous parts are the head, prothorax (except for a large triangular basal infuscation), shoulders, prosternum, mesosternum, metasternal episterna, legs (except hind coxæ), and antennæ (the apical joints slightly infuscated). The abdomen, when not contracted, is longer than the elytra.

Neocarphurus coatesi Lea.

Four specimens (sexes) of this species, from the National Park of Queensland, differ from the types in having the apical two-thirds of prothorax deeply infuscated or blackish.

Balanophorus biplagiatus Fairm.

Two specimens (sexes) from Cairns possibly belong to this species (described originally as from Peak Downs). They differ, however, from the description in

having the apical fourth of elytra obscurely infuscated, the abdomen uniformly pale, of the legs only the tarsi infuscated, and that seven of the apical joints of antennæ are infuscated. In the original description the parts noted were described as follows: "*elytris . . . apicem macula fusca transversim signatis, abdomine . . . apice late nigro. . . . pedibus fuscis, antennis . . . articulo ultimo obscuro.*" The antennæ were also described as "*ab articulo tertio longe flabellatis.*" On the Cairns male the antennal pectinations are rather shorter than usual in the genus, although decidedly longer than on *Carphurus*; it also has a small interocular spot. The female differs from it in having the antennæ strongly serrated only, the head immaculate, and the hind femora narrowly infuscated on the upper surface.

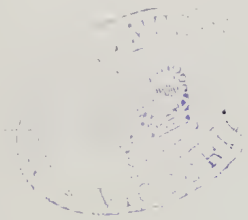
Balanophorus mastersi Mael.

A male without locality label, in the South Australian Museum, but probably from South Australia, differs from normal males in having the antennal rami much shorter, only about half as long as the width of the head, instead of as long as its widest part.

Balanophorus concinnus Lea.

A male from Cairns agrees well with the type, except that the hind legs are pale, with the exception of the infuscated tarsi.

END OF Vol. IX, *MEMOIRS OF THE QUEENSLAND MUSEUM.*



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